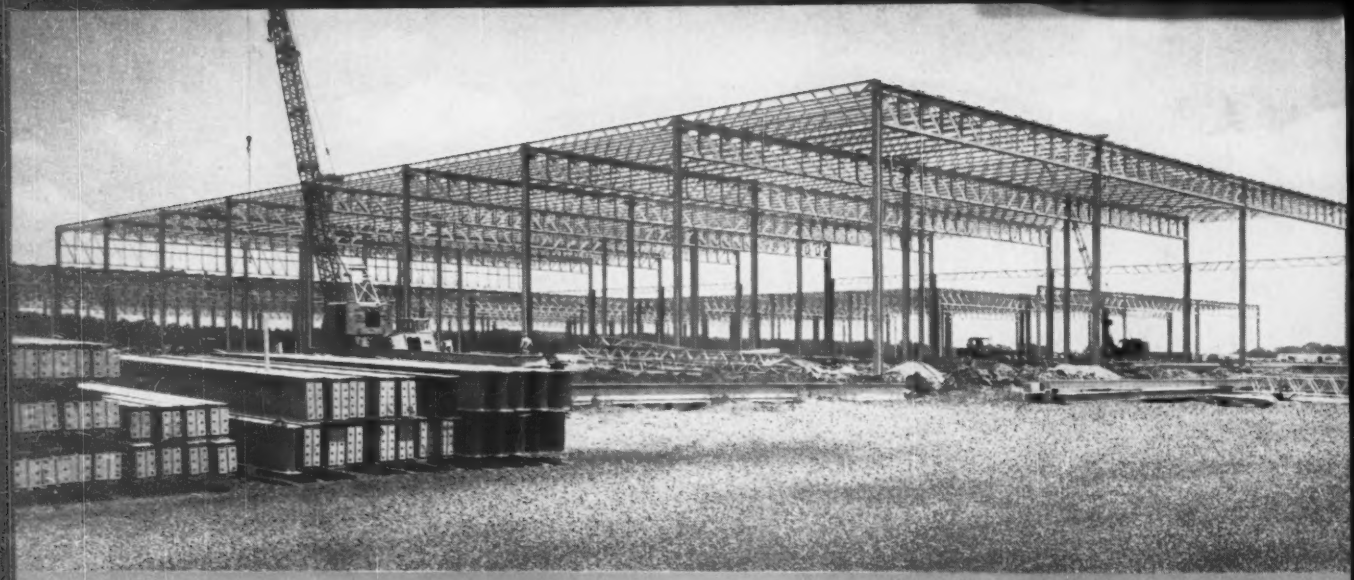
ENGINEERING NEWS-RECORD

Big augers drill 115 ft to bedrock

STEVENS RICE GS N
UNIV MICROFILMS INC EDIT
313 N FIRST ST
ANN ARBOR M

A McGRAW-HILL PUBLICATIO



Meredith Printing Company, Des Moines, Ia.

WHEN IT COMES TO

STRUCTURAL STEEL

YOU'LL DO BETTER WHEN YOU COME TO

Pittsburgh-Des Moines

Precise shop fabrication and highly-skilled field erection are part of the reasons why. But of equal importance to you are the administrative experience and caliber of supervision that assure smooth operation and on-schedule project completions when PDM handles the job. Six fabricating plants across the country to serve you. Check our nearest office for consultation and quotation, without obligation.

PDM STEEL COMPANY

Memorial Coliseum, Des Moines, Ia.

Auditorium dome, John J. Kane Hospital, Pittsburgh, Pa.

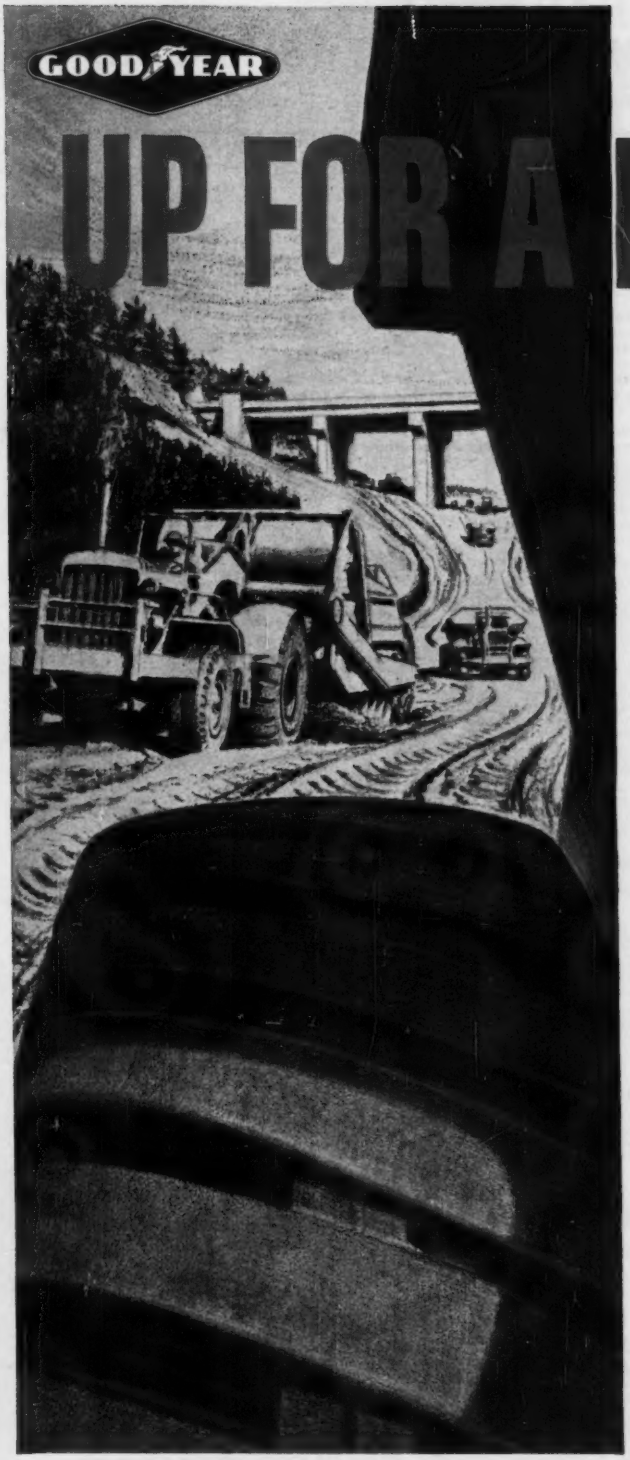
Field House,
Allegheny College,
Meadville, Pa.

PITTSBURGH-DES MOINES STEEL COMPANY

Plants at PITTSBURGH, WARREN, BRISTOL, PA. • BALTIMORE • BIRMINGHAM • DES MOINES • PROVO, UTAH • CASPER, WYO. • SANTA CLARA, FRESNO, STOCKTON, CALIF.

Sales Offices

PITTSBURGH (25).....Neville Island
WARREN, PA.....P. O. Box 660
BALTIMORE (26).....P. O. Box 3498, Curtis Bay Station
BIRMINGHAM (3).....P. O. Box 9641, Ensley Station
DES MOINES (8).....1015 Tuttle Street
PROVO, UTAH.....P. O. Box 310
SANTA CLARA, CALIF.....P. O. Box 329
EL MONTE, CALIF.....P. O. Box 2012
NEW YORK (17).....200 East 42nd Street
NEWARK (2).....744 Broad Street
CHICAGO (3).....679 First National Bank Bldg.
ATLANTA (5).....361 East Paces Ferry Rd., N. E.
DALLAS (1).....Suite 1703, Southland Center
DENVER (2).....323 Railway Exchange Bldg.



UP FOR A BIG BID?

Let Goodyear keep your tire costs down

FINDING THE WORK FACTORS—Goodyear Big-Tire Specialists are prepared to analyze your tire needs with an eye to keeping costs under control. These specialists will check the terrain, loads, climate, roads, schedules and speed problems that confront you, and can select the right Goodyear tires to help you solve them.

PUTTING BIG-TIRE KNOW-HOW TO WORK—From the world's greatest wealth of experience, Goodyear Big-Tire Specialists are uniquely qualified to help you. And they'll provide the best in tread and body designs to help safeguard your contract and your profits.

SETTING UP BIG-TIRE SERVICE—You say the word, and Goodyear Big-Tire Specialists will set up a tire-maintenance program at the job-site to help save you man-hours, machine-hours and useful tire life. In addition, Goodyear Contractor Service *will travel* with your job—handle all your tire maintenance and repair needs.

With BIG-TIRE PERFORMANCE
Example: SUPER HARD ROCK LUG

Here's one of Goodyear's Big Tires for the Big Bid you have coming up. It's the SUPER HARD ROCK LUG, built for heavy loads and no roads to make the going easy. Triple-tough 3-T Nylon Cord for the greatest tire stamina, plus new, special cut-shrugging rubber compounds, make this tire a real cost-saver in the roughest off-highway service.

For details on this and other Goodyear special-duty tires, and the Goodyear Contractor Service, see your Goodyear dealer. Or write Goodyear, Truck Tire Dept., Akron 16, Ohio.

Lots of good things come from

GOODYEAR

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

400 Feet Daily

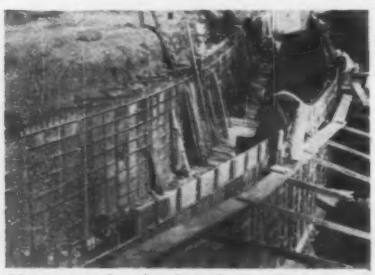
Extension Brackets and Symons Steel-Ply Forms

. . . enable contractor to pour at 15c a Square Foot

California contractor, Elmer J. Freethy saved substantially in pouring a channel lining for a flood control project at Pleasant Hill, California. It involved curved walls 9 ft high and 4,000 ft long.

Symons 8 ft Steel-Ply Forms were used with Symons New Extension Bracket, to get the additional foot. In addition to speed, the extension gave the final foot the appearance of a cap on the wall.

Wall specs called for a ½" extension joint every 40 lineal feet. The contractor had the ½" premoulded material cut 3" wider than the wall and used the wall forms to hold it in position. By using a 1" filler on these joints they were able to tie the forms together with long connecting bolts and pour the walls continuously.



Note extension brackets in foreground and minimum amount of bracing required for curved walls.

Symons Steel-Ply Forms are *rented with purchase option.*

Symons

SYMONS CLAMP & MFG. CO.

4265 Diversey Ave., Dept. E-1, Chicago 39, Ill.

Warehouses Thruout the U.S.A.

MORE SAVINGS FROM SYMONS

ENGINEERING NEWS-RECORD

EIGHTY-SEVENTH YEAR OF PUBLICATION

A McGraw-Hill Publication • 330 West 42nd Street, New York 36, N.Y. • LOngacre 4-3000

Editor, Waldo G. Bowman

Managing Editor, Arthur J. Fox, Jr.

Senior Editors, Frederick S. Merritt, James B. Sullivan, Leo J. Ritter, Jr.

Transportation—Roads, Bridges, Railways, Airports, Pipelines, Ports
Leo J. Ritter, Jr., Edward M. Young, Jr., Joseph F. Wilkinson

Buildings—Commercial, Industrial, Housing; Codes, Specifications
Frederick S. Merritt, David B. Hill, C. W. Griffin, Jr., Ronald G. Burns

Water—Sanitation, Water Supply, River Control, Power, Irrigation
James B. Sullivan, William W. Jacobus, Jr., Marie Jensen

Business—Management, Labor, Finance, Markets, Contracts, Economics
Robert J. Stinson, Charles J. Harding

Regional Editors
J. Roland Carr, *Chicago, 645 N. Michigan Ave.* (*MOhawk* 4-5800)
Martha Alexander, *Staff Assistant*

Laurens L. Wise, *San Francisco, 255 California St.* (*DOuglas* 2-4600)
Anne Garcia, *Staff Assistant*

Copy—Production
Irwin Landau, Nancy Parkes, John C. Greenough, Robert M. Echols

Presentation
Harry W. Jensen, Robert G. Young

Statistics, Prices, Costs—Business News
Elsie Eaves, *Manager*
Julia Mahoney, *Construction Reports*
Mildred Wetzel, Marian Sciorra, Marie Moravsik
Eleanor Queret, Francine Todisco, Helene Wahlers, Arlene Spielman
James Webber, Ruth Carlson, *Economics*
William P. Larkin, *Prices, Wages, Indexes*
Evelyn Huber, Edith Ostwald, *Statistics*
D. Arlene Ricker, *Unit Prices*

Editorial Research and Indexing
Eva Glerat, Rene Hay, Jane Jacobson

Consulting Editors: **Van Tuyl Boughton, Nathan A. Bowers**

Advertising Sales Manager: **Donald S. Robertson**

Circulation Manager: **Edward F. Bressler**

Washington Bureau, National Press Bldg., Washington 4, D. C., (*REpublic* 7-6630), George B. Bryant, Jr., Chief, Alan Adams, Glen Bayless, Herbert Cheshire, Boyd France, Charles Gardner, Arthur Hermann, Donald Loomis, Daniel McCrary, Gladys Montgomery, Arthur Moore, Burkey Musselman, Seth Payne, Dean Reed, Morton Reichek, Caroline Robertson, David Secrest, Richard Smith, Vincent Smith, Harry Vandernoot.

Domestic News-Bureaus: Atlanta—1375 Peachtree St., B. E. Barnes, Chief, Frances Ridgeway; **Chicago**—645 N. Michigan Ave., Stewart Ramsey, Chief, Bruce Cross, Eric Aiken; **Cleveland**—55 Public Square, Arthur Zimmerman, Chief, Violet Forsha; **Dallas**—2100 Vaughn Bldg., Marvin Reid, Chief, Mary Lorraine Smith, Mae Brown; **Detroit**—856 Penobscot Bldg., Donald MacDonald, Chief, Wesley Perry, Jr., Del Yannatta; **Los Angeles**—1125 W. 6th St., Kemp Anderson, Jr., Chief, Carl Havighorst, Michael Murphy, Marvin Petal, Bill Wallace, Mary Williams, Barbara Lamb; **San Francisco**—255 California St., Jenness Keene, Chief, Donald Winston, Allison Lunt; **Seattle**—6040 Fifth Ave., N.E., Ray Bloomberg.

Foreign News Bureaus: London—John Shinn; **Paris**—Robert Farrell; **Mexico City**—Peter Weaver; **Bonn**—Pete Forbath; **Beirut**—O. M. Marashian; **Tokyo**—Sol Sanders; **Rio de Janeiro**—Leslie Warren; **Caracas**—John Pearson; **Moscow**—Ernest Conine.

Correspondents: In 70 principal U. S. cities and 70 cities throughout the world.
Director of News Bureaus: John Wilhelm; Managing Editor, Margaret Ralston.
McGraw-Hill Economics Department: Douglas Greenwald, Manager.

ABP ABC

MEMBER

Publisher, Robert F. Boger

ENGINEERING NEWS-RECORD, Vol. 166, No. 21, MAY 25, 1961

Published weekly by McGraw-Hill Publishing Company, James H. McGraw (1860-1948), Founder. Printed at Albany 1, N. Y. See panel below for directions regarding subscriptions or change in address. Executive, Editorial, Advertising and Circulation Offices: McGraw-Hill Building, 330 W. 42nd St., New York 36, N. Y. OFFICERS OF THE PUBLICATIONS DIVISION: Nelson L. Bond, President; Shelton Fisher, Wallace F. Traendly, Senior Vice Presidents; John R. Callaham, Vice President and Editorial Director; Joseph H. Allen, Vice President and Director of Advertising Sales; A. R. Venezian, Vice President and Circulation Coordinator. OFFICERS OF THE CORPORATION: Donald C. McGraw, President; Joseph A. Gerardi, Hugh J. Kelly, Harry L. Waddell, Executive Vice Presidents; L. Keith Goodrich, Vice President and Treasurer; John J. Cooke, Secretary. Subscriptions are solicited only from persons with identifiable commercial or professional interests in construction and building. Position and company connection must be indicated on subscription orders. Publisher reserves the right to refuse unqualified subscription. United States subscription rate for individuals in the field of this publication $6.00 per year, single copies 50 cents; foreign $20 per year, payable in advance. Second-Class mail postage paid at Albany, N. Y. Printed in U.S.A. Title registered in U.S. patent office.

©Copyright 1961 by McGraw-Hill Publishing Co., Inc. All Rights Reserved.

UNCONDITIONAL GUARANTEE: Our primary aim is to provide subscribers with a useful and valuable publication. Your comments and suggestions for improvement are encouraged and will be most welcome. The publisher, upon written request, agrees to refund the part of the subscription price applying to the remaining unfilled portion of the subscription—if editorial service is unsatisfactory.

SUBSCRIPTIONS: Send subscription correspondence and change of address to Fulfillment Manager, ENGINEERING NEWS-RECORD, 330 W. 42nd St., New York 36, N. Y. Subscribers should notify, publisher *promptly of any change of address, giving old as well as new address, and including postal zone number,* if any. If possible enclose an address label from a recent issue of the magazine. Please allow one month for change to become effective.

Postmaster: Please send Form 3579 to Fulfillment Manager, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

THERE'S a reason why you find Northwest machines on the tough jobs! It is the record they have made on thousands of jobs, large or small, for getting the job done!

POWER TO HANDLE ROCK: Shovels are bought to handle rock! It takes power — and ripping through hard material takes smooth *control* and *power.* Your operator needs the "feel" that tells him what his dipper teeth are doing. He needs the most powerful Crowd you can give him. *Put him on a Northwest!* Give him the Shovel that has *speed, power and endurance.* Give him the Shovel with the Dual Independent Crowd!

Give him the Feather-Touch Clutch Control, that lets him nudge a rock with the feel of the load to a degree *impossible* with any air or hydraulic control.

Watch a Northwest work . . . It will pay big . . . Talk with Northwest owners. Keep posted on Northwest equipment. Let a Northwest man bring you up to date.

NORTHWEST

CRANES • SHOVELS • DRAGLINES
PULLSHOVELS • TRUCK CRANES

3/4 to 3 Cu. Yd. Capacity

NORTHWEST ENGINEERING COMPANY

1502 Field Bldg. • 135 South La Salle St. • Chicago 3, Illinois

S-80-34-LC

Fir plywood helps solve problem on giant

SCIOTO DOWNS RACE TRACK
LOCATION: Columbus, Ohio
ARCHITECTS: Kellam & Foley, Columbus
STRUCTURAL ENGINEERS:
Gensert, Williams & Associates, Cleveland
CONTRACTOR: Sheaf Construction Co., Columbus

complex forming concrete umbrella roofs

PLYWOOD'S UNIQUE ADAPTABILITY as concrete form material simplified a complicated roof construction job at the Scioto Downs race track, Columbus, Ohio. At the same time, plywood created smooth concrete surfaces and kept costs low.

The striking grandstand roof is a series of huge hyperbolic-paraboloid concrete shells. Each 61 x 116-ft. section is supported by a 44-ft. column. The clubhouse and offices have thin-shell concrete folded plate roofs.

Plywood was shaped so easily to the complex curvatures of the grandstand roof, and made such tight joints, that the contractors found it needed no liner. Original specifications had been for lumber or plywood backing faced with hardboard for surface smoothness. But a single layer of ¾" plywood to do both jobs resulted in a smooth, fin-free concrete surface, besides eliminating the labor and material cost of applying liner.

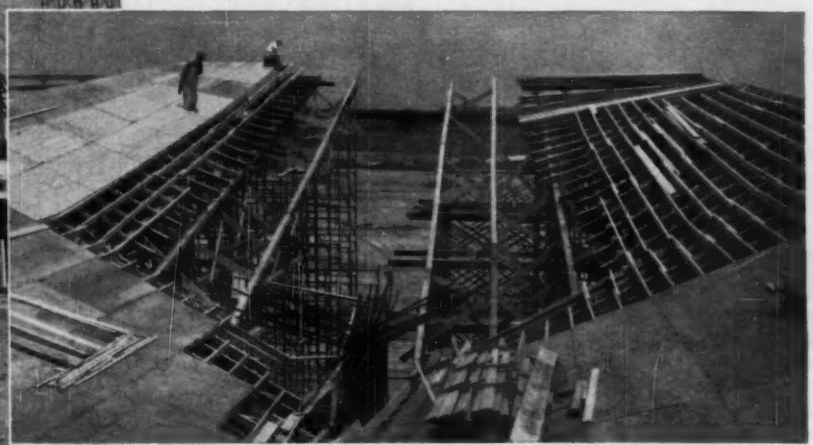
More savings came from plywood's ease of handling, which the contractors called a real cost cutter. And rate of re-use was exceptionally high. Panels stripped from the grandstand roof were used on the folded plates and were still good for many more times. There was only a four percent loss out of 10,000 sq. ft. of plywood.

DOUGLAS FIR PLYWOOD ASSOCIATION
TACOMA 2, WASHINGTON

—a non-profit industry organization devoted to research, promotion and quality control

DFPA TESTED QUALITY

ALWAYS SPECIFY DFPA-QUALITY TRADEMARKED PLYWOOD.
Concrete form grades include: INTERIOR PLYFORM®— made with moisture-resistant glue, gives up to 10-12 re-uses; EXTERIOR PLYFORM®— waterproof glue, gives up to 25 or more re-uses; OVERLAID EXTERIOR PLYWOOD —premium panel, forms smoothest concrete, gives up to 200 re-uses.



Grandstand roof forms were of ¾" fir plywood over a grid of 2x4's and 2x6's. Panels adapted readily to required curves, yet joints were tight and final concrete surface was smooth and even. Office building behind grandstand and clubhouse at side have continuous folded plate concrete roofs. They were formed against plywood panels previously used on grandstand roof.

RECOGNIZED THE WORLD OVER for highest accuracy, convenience, and unequaled precision throughout the instrument. MOST WIDELY USED for first and second order triangulation, and in industry and laboratories where extremely accurate angle measurements are required. Accessories are available for astronomical use.

WILD
HEERBRUGG

WILD T-3
PRECISION THEODOLITE
One of a *complete* line of superb instruments for Surveying, Photogrammetry and Microscopy. *Write for booklet T-3.*

WILD HEERBRUGG INSTRUMENTS, INC. • PORT WASHINGTON, NEW YORK
In Canada: Wild of Canada Ltd., 157 Maclaren St., Ottawa, Ontario

Reader Comment

Slip-Up on Slip-On

SIR—I was quite interested in the article on the use of push-on joint pipe in the waterworks field (ENR Apr. 13, p. 68).

Unfortunately, however, there is one gross error in the article. The next to last paragraph states that the cost of materials for push-on joint pipe is slightly higher than for mechanical and bell-and-spigot pipe. This definitely is not correct with the U.S. Pipe Co.

Our company offers push-on joint pipe at an extra charge over bell-and-spigot pipe. However, this extra charge is about half of the extra charge for mechanical joint pipe as compared to bell and spigot.

I am afraid the paragraph in the article may be misleading to some of your readers.

CARL N. BROWN
Sales Manager-Pipe
United States Pipe and Foundry Co.
Birmingham, Ala.

Editor's Note—Other manufacturers of cast-iron pipe have also pointed out the error. Material costs of slip-on or push-on joint pipe are lower than those of mechanical joint pipe, not higher as indicated in the article. Both cost more than the bell-and-spigot pipe.

Another error crept into our reference to the size range in which the pipe is available. The slip-on joint pipe can be found in sizes ranging from 2 in. through 48 in.

Passamaquoddy: R. I. P.

SIR—You note the U. S.-Canada International Joint Commission's rejection of the proposed $687-million Passamaquoddy tidal project (ENR May 4, p. 15). It has been about 35 years since the first rejection of the scheme for the identical reason—"economically unfeasible."

In 1926, Dexter Cooper was instrumental in the development of a scheme to harness the tides of Passamaquoddy Bay. He advanced the idea to the point where a group of interested financial backers asked Murray and Flood to pass on the feasibility and economical advisability. In turn, Murray and Flood asked Henry Goldmark, with whom the writer was then associated, to determine the possibility of obtaining fixed power

(*Reader Comment continued p. 10*)

Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

engine power

BY CATERPILLAR

Here's a new profitable combination

Caterpillar-powered Gardner-Denver "Rota-Screw" portable air compressors reduce maintenance to lowest costs ever

Here is a major breakthrough in performance which means new low costs to users of compressed air. Gone are rotary blades or pistons. A helical "Rota-Screw" now eliminates blade chatter, vibration and whine. Quietness, pulsation-free air and minimum maintenance are the results.

Gardner-Denver's new SP900, a 900 CFM machine, is powered, as standard equipment, by the Cat D343 Diesel Engine. The SP600, a 600 CFM machine, is standard with the Cat D333 Diesel Engine. You get four-cycle design with full-stroke efficiency, plus full-length, watercooled cylinder liners for efficient cooling. Aluminum alloy pistons give low reciprocating weight, valve rotators distribute valve face wear and low-friction aluminum alloy bearings are known for superior strength and load carrying ability.

You'll like the Cat-powered Gardner-Denver line for the Caterpillar fuel system that provides "constant power" with *no* adjustments. Low-cost, high BTU fuels, such as household furnace oil, can be used instead of premium-cost No. 1 diesel fuel. Single orifice injectors and precombustion chamber design prevent fouling, even during long periods of idling between air demands. Electric glow plugs and ether starting arrangement are standard for quick, sure starts at below zero temperatures. Compressors are tested for a temperature range of –40° F. to 115° F.

Compressor service is available through a world-wide network of Gardner-Denver service points. In the U. S. alone there are over 5100 Caterpillar Dealer field service trucks on 24-hour-a-day call for engine service.

For more information on this new concept in compressors, write to the Gardner-Denver Company, Quincy, Illinois. Your nearby Caterpillar Dealer can tell you more about Cat Diesel and Natural Gas Engine Power for every application requiring from 50 to 950 HP, or write to Department 516, Engine Division, Caterpillar Tractor Co.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

Engine Division, Caterpillar Tractor Co., Peoria, Ill., U. S. A.

BOLT TENSION

AN IMPORTANT

NOW . . . fast, accurate, consistent tensioning of high-strength bolts with new Gardner-Denver Tension Control Wrench

NEWS ITEM: Research Council publishes new specifications for bolted connections.

NEWS ITEM: Manufacturers introduce high-strength structural bolts—specifically designed for tensioning.

NEWS ITEM: Gardner-Denver announces new tool that accurately and consistently controls clamping force applied to an assembly.

The newly developed Gardner-Denver Tension Control Wrench completely embodies the concept of bolt tension as a clamping force. It's lightweight, compact and adjustable. A simple control accurately regulates input; consequently, it accurately controls output of the wrench. This new air tool also incorporates the patented Gardner-Denver impact mechanism—proved fast-acting and reliable in both industrial and construction fastening.

Accurate bolt tensioning is accomplished in three to five seconds—well within the ten seconds specified by the Research Council.

TWO MODELS . . . 18B-7T AND 18B-9T

MAKE A DATE—WE'LL DEMONSTRATE

You have to see this amazing new wrench in action to completely appreciate its capabilities and possibilities. It took test after test after test to convince Gardner-Denver engineers themselves that they'd found a completely reliable way to assure accurate tensioning. We think you'll be convinced, too, once you see a demonstration. Ask your Gardner-Denver representative for an appointment.

FIVE IMPORTANT ADVANTAGES

1. **Uniformity of bolt tension** every time, regardless of variables in fasteners or air pressure.
2. **Reduced costs,** by using fasteners to their designed capacities.
3. **Stronger bolted assemblies** because fasteners can now be tightened to stand load variables.
4. **Built-in standard control** with no attachments. All standard parts, nothing extra to buy.
5. **Control override** for reversing fasteners, or for using full wrench power if desired.

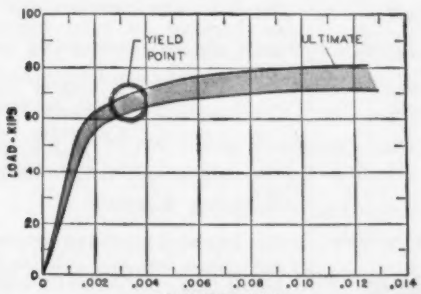
REPORT FROM GARDNER-DENVER

Problems with Torque Control—When tightening bolts by the torque control method, there is no reliable way to tell if they have been tensioned. Torque readings are subject to many forms of interference. To mention a few: irregular threads, burrs, rust and scale, bent washers. Torque readings will vary if threads are lubricated or dry, if washers are soft or hardened.

All these variables offer resistance in the form of friction. Consequently, as a nut is being tightened, the resistance increases until friction becomes great enough to signal the operator or torque control mechanism to stop. Perhaps the bolt has reached its desired clamping force. Perhaps not. The very first obstruction can cause a sharp increase in torque resistance, and the result may be a large variation in true bolt tightness.

New Approach to Bolt Tensioning—However, if you follow the Research Council specifications for tensioning, you're absolutely sure the bolt is tight every time. A new approach to a practical method of obtaining bolt tension was made by Gardner-Denver's research and development engineers. When the new high-strength bolts are tightened to their yield point, the force required is great enough to overcome all frictional interference, and to obviate the effect of frictional variables on final joint tightness.

Gardner-Denver engineers determined that if input energy to the wrench could be controlled, the output energy could stress bolts to their yield point (see chart) without approaching ultimate bolt strength. Many impact blows were found to be the answer. These blows, however, must always have the same output force if the bolt is to reach its desired clamping force. Further testing demonstrated that when predetermined bolt tension is reached, the nut will stop turning, even though the wrench continues to impact.



CALIBRATION CURVES OF 1-INCH DIAMETER HIGH TENSILE BOLTS

Consistent, Reliable Results—In test after test, Gardner-Denver engineers were amazed at the consistent results achieved with their new Tension Control Wrench. They tightened the same fastener over and over again; the results were the same. They tried other bolts of the same size and achieved consistent tension results. They reset the wrench for bolts of other sizes and materials, and again achieved consistent bolt tensioning every time. This reliability is possible because the wrench can be adjusted to obtain a predetermined tension in any bolt. This clamping force is so great that the variables mentioned above yield until the specified bolt tension is obtained.

Application in the Field—Bolt manufacturers specify minimum proof load and minimum yield. In the field, yield point can be determined by use of a conventional torque wrench or by hand wrenching. It will be indicated by the "steady torque"—the point at which continuous torque (no increase) will continue turning the nut. You find this yield point on a sample bolt—then, using a simple screw adjustment, set the Tension Control Wrench to obtain the same bolt tension. Once set, the wrench will tighten one or thousands of these particular bolts with consistent, accurate results. The Gardner-Denver wrench can quickly be readjusted to handle bolts of other sizes or other materials.

GARDNER-DENVER Since 1859

EQUIPMENT TODAY FOR THE CHALLENGE OF TOMORROW

GARDNER-DENVER

Gardner-Denver Company, Quincy, Ill.—Offices in principal U.S., Canadian and Mexican cities
In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Ave., Toronto 16, Ontario

International: Gardner-Denver International Division, 233 Broadway, New York 7, N.Y.
Offices: Buenos Aires, Argentina; Artarmon, N.S.W. Australia; Brussels, Belgium; Rio de Janeiro, Brazil; Santiago, Chile; Barranquilla, Colombia; Lima, Peru; Ndola, N. Rhodesia; Salisbury, S. Rhodesia; Johannesburg, Transvaal

The Clay Pipe Industry's research has pioneered dramatic new developments, making production and installation of lifetime Vitrified Clay Pipe more efficient and effective.

For example, Clay Pipe Industry research discovered the revolutionary resilient compression joints which are now offering important savings in installation time and cost to users of lifetime Vitrified Clay Pipe sanitary sewers.

Other important tests are now going on at the Crystal Lake facility, by contract at colleges and universities all over the country, and at the modern laboratories maintained by individual Clay Pipe manufacturers.

One experiment that promises to have far-reaching effects: detailed, year-long observations of root penetration of 16 separate sewer pipe joints. Others include shear load studies of both pipe material and joints, development of new, less expensive jointing materials and techniques, exhaustive analyses of competitive products, flow-coefficient studies, and various tests aimed at improving the clay pipe itself.

Results of the most significant of these tests will be announced as they become available.

Under the direction of A. J. Reed, NCPMI Vice President and Director of Research, new breakthroughs in manufacturing and uses of Clay Pipe are being made, offering greater, more confident service to those who specify and use lifetime Vitrified Clay Pipe.

NATIONAL CLAY PIPE MANUFACTURERS, INC.
914 20th Street, N. W.
Washington, D. C.

Please send me full details on the new factory-made compression joints on Clay Pipe.

(name)

(company)

(street address)

(city and state) B-1C23 EN

COMPRESSION SEALED, VITRIFIED
CLAY PIPE
IMPERVIOUS
THE STANDARD in SANITARY SEWERS

NATIONAL CLAY PIPE MANUFACTURERS, INC.
Washington, D. C.

. . . Reader Comment

from the tides and also the cost of the dams, gates and sluiceways.

At that time, our analysis of daily water volumes available over a period of a year at the available heads showed that fixed power could be obtained only if either standby steam generating capacity was made available for a small percentage of the time or else some high-level storage reservoirs were added and filled during peak generation periods. Either scheme required expenditures that made the over-all cost higher than steam generation by itself. The project was abandoned as "economically unfeasible."

Since then, large sums of money and almost countless man-hours have been expended in studies, investigations and estimates, to say nothing of the construction of a Passamaquoddy Village to house the future workers on the construction project. Such technical exercise, of course, develops experience and knowledge and has some value. But cannot that time and money be better spent for more worthwhile developments of projects having a better chance of return to the public good, even though they may not be as glamorous to the nontechnical public?

JACOB FELD
Consulting Engineer
New York, N. Y.

Check Secondary Stresses

SIR—I read the editorial in ENR May 11, p. 80, on the need for stiffer steel and agree with you that we may be going too far in producing higher strength steels without substantially increasing their elastic resistance.

There is one aspect of high-strength steels that should be emphasized; their effect on secondary stresses. For the complex structures we are designing today, careful investigation of and structural provision for secondary stresses are of the greatest importance to avoid failures. Danger of a failure due to ignoring secondary stresses may be increased by using high-strength steels without corresponding increased stiffness.

O. H. AMMANN
Ammann & Whitney
Consulting Engineers
New York, N. Y.

Wrong Gage

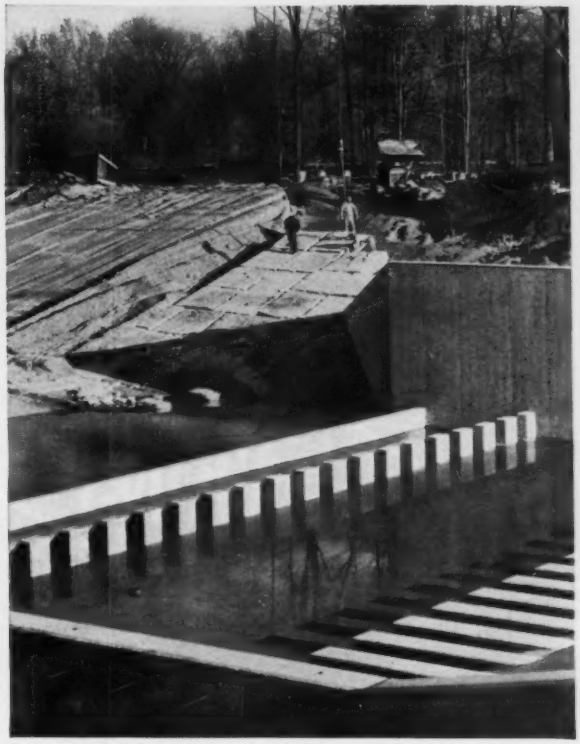
SIR—We were pleased to see your news item about our new redesign type A Inland Steel roof deck (ENR Mar. 16, p. 60). But we were sorry to note that one of the three gages of steel you mentioned is incorrect.

The item should have read: ". . . Inland Type A Deck is offered in 18, 20 and 22 gages, in either Bonderized-and-prime painted or galvanized steel, in lengths up to 28 ft 6 in."

T. G. BENNETT
Inland Steel Products Co.
Milwaukee, Wis.

Speedway or Spillway

Daytona International Speedway, Daytona, Florida



Spillway at Bridge Creek Dam, Geauga County, Ohio

The all-purpose construction aggregate:

USS Blast Furnace Slag

No matter where you use it, you won't have to sacrifice durability for economy if your construction aggregate is USS Blast Furnace Slag. That's because all-purpose slag gives you both. Economy, because slag is lighter—other aggregates weigh as much as 50% more per cubic yard. Durability, because slag is tough, hard, clean and sound. Slag particles are vesicular in nature and angular in shape so they form a tight, long-lasting bond in either bituminous or portland cement concrete. Pavements made with slag have hard surfaces that are highly resistant to wear . . . yet won't become slick or cause skidding. Concrete structures made with slag resist moisture penetration, so they are highly resistant to weathering and frost action.

Learn more about Blast Furnace Slag and its many applications—get durability and economy in your next job. Write United States Steel, Slag Products Section, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

USS United States Steel

TRADEMARK

The Sign of a Real Bargain in an IRON BODY GATE

Cost-Per-Year is Lower... Initial Cost no Higher

For generations extra-quality, extra-stamina Jenkins Iron Body Gates were regarded as the best buy for the money . . . even though they cost more to buy. Lower maintenance expense and extra years of service more than offset any price differential.

Today, these widely favored valves are an even bigger bargain in true value. *You pay no more for them at the start!* And you get exactly the same high quality and perfection of design for your money.

You can satisfy all your needs from the complete line of Jenkins Iron Body Valves. Jenkins Bros., 100 Park Avenue, New York 17.

AVAILABLE FROM LEADING DISTRIBUTORS EVERYWHERE

JENKINS
MOST TRUSTED TRADEMARK IN THE VALVE WORLD
VALVES
JENKINS SINCE 1864
Jenkins Bros

ENGINEERING NEWS-RECORD

Vol. 166, No. 21 May 25, 1961

Number of copies printed in this issue 87,567

CONTENTS

A Building Boom in Depressed Areas?..... 17
$125-Million Center Takes Shape..... 18
Outlook: $4 Billion in School Building..... 19
How Do New Materials Stack Up?..... 19
Partnership Woes for Federal A-Power..... 20
A-Power's a Bargain in Polar Regions..... 21
A $450-Million Housing Complex Off Manhattan 22
Loose Joints Weakened Texas Tower..... 24
Yuba Project Has Highest Fill Dam..... 24

FEATURES

Delta Girders for a Short Steel Span..... 27
Big Augers Go Deep So Buildings Can Go High 32
Folded-Plate Space Truss Spans Gym..... 35
Titan's Powerhouse: Designed to Beat the Bomb 38

INTERNATIONAL

High Tower for San Juan Bank..... 41
Radial Steel Bents Frame Round Roof..... 42

FIELD AND OFFICE

How to Design Highway Hardware..... 51
Big Bucket Holds 35 Cu Yd..... 52

RESEARCH AND DEVELOPMENT

Fabricator Moves to Cut His Costs..... 53

NEW PRODUCTS

A Square Joins the Lamp Line..... 57
Ready-Mixed Cement Mortar..... 57

BUSINESS AND FINANCE

Aluminum After Big Jobs, Small Homes..... 79
Standard Specs Wanted in California..... 79

LABOR

New Look for the Labor Board?..... 81
Unemployment Costs May Mount..... 81
Builders Aim at Uniform Rates..... 82
For Labor Peace..... 83

Reader Comment ... 8
Washington Observer 15
Materials Prices 61
Construction Reports. 62
Statistics, Indexes .. 75
Editorials 92

Picture Credits

Cover, 32—ENR; 18—Welton Becket and Associates; 33—Peter M. Spizziri; 35—American Institute of Steel Construction; 38, 39—Martin.

Back issues of ENGINEERING NEWS-RECORD *are generally available for the previous six months. Semiannual indexes will be sent on request.* ENGINEERING NEWS-RECORD *is also indexed in the Applied Science & Technology Index, Business Periodicals Index and the Engineering Index.*

THE CONSTRUCTION WEEK

CHEAPER HIGH-STRENGTH STEEL—Look for savings ahead now that U. S. Steel has started commercial production of rolled structural shapes made from high-strength, quenched and tempered alloy steels. Until now fabricators had to meet the demand for high-strength sections by welding plates together. The use of rolled shapes instead of built-up members could bring savings of up to 30%.

MEN WORKING—Construction scored the biggest employment increase of all the nonfarm industries last month. Its employment total rose by 200,000 over the month—"substantially better than seasonal," reported the U. S. Labor Department. April's total of 2,644,000 was 54,000 above the total for April '60.

THUMBS DOWN—A California State Assembly committee has killed legislation needed to start construction on a 74.9-mile, $529.7-million rapid transit system for Los Angeles. The transit plan was drawn up by consultants Daniel, Mann, Johnson and Mendenhall (ENR July 7, 1960, p. 24).

TIME OUT ON HIGH VOLTAGE LINE—A federal task force says it will take another six months to complete engineering and legal planning of the proposed $200-million transmission line between California and the Bonneville Power Administration. The task force was appointed by Interior Secretary Stewart L. Udall, who has urged construction of the 500-kv line.

TO EACH HIS OWN—Labor Secretary Arthur Goldberg may recommend forming three arbitration groups to handle missile labor disputes. Two would be labor-management-public panels—one for construction, one for manufacturing disputes. The third, with public members only, would cope with craft-industrial union disputes.

DOWN TO THE SEWER IN SHIPS—The manager of the Little Rock, Ark., Sewer Department is fresh back from an all-expense-paid spring cruise. The city picked up the tab and even built his boat to order. Dragging their sash-weight anchor behind them, T. W. Clapham and his maintenance foreman toured six miles of new 60-in. trunk sewer aboard a small boat custom built for the inspection. Mr. Clapham says sewer boating beats sewer walking.

WHAT'S THE RANSOM?—Does Fidel Castro want tractors for roadbuilding, or farming, or both? And exactly how many does he want as ransom for 1,200 political prisoners? At the start of the week his negotiators were fuzzy about the details. Walter Reuther, one of a group of Americans negotiating the ransom, may have to go to Havana to find out what Fidel was talking about.

GRIFFIN **Solves Another Dewatering Problem!** To build 11 double piers for the Chicago-to-St. Paul Expressway Bridge over the fast-flowing Wisconsin River, contractor procedure called for constructing three earth cofferdams in the coarse sand, gravel and boulders of the river . . . Typical of construction speed was the progress made in only 10 weeks in the cofferdam shown above: • Construct cofferdam—2 weeks • Install Wellpoint system and dewater to grade—one week • Excavate, drive piles and pour concrete up to river level—7 weeks.

Further proof of time and money saving advantages of Griffin Wellpoint planning, supervision and equipment.

RENTAL / CONTRACT / SALES **GRIFFIN**

GRIFFIN WELLPOINT CORPORATION · GENERAL OFFICE: 881 E. 141st St., New York 54, N.Y.

Branches: Hammond, Ind. • Jacksonville, Fla. • New York, N.Y. • Houston, Tex.
Redwing, Minn. • W. Palm Beach, Fla. • Norfolk, Va. • Gulfport, Miss.

WASHINGTON OBSERVER

- **Housing bill to the rescue**
- **Congress to check on Interstate tollroads?**
- **Is Blatnik avoiding Massachusetts?**

- **New housing legislation is coming at a time when the industry can stand some stimulus.** A report by the Federal Reserve Board estimating intentions of consumers to buy houses is not optimistic. The Fed report shows that 5.1% of those queried plan to buy a house in the next 12 months; that compares with 5.3% in April a year ago. In actual purchases, first quarter sales matched last year's first quarter total.

  The Senate is ready to vote a program giving aid in all areas—increased mortgage-buying authority for Fannie May, longer-term mortgages for homes and renovations, other aids, as well as an increase in public housing to 100,000 units a year.

  There is one bit of controversy in the Senate bill. The Banking Committee approved a provision for federal aid for mass transit systems. The Administration has not approved of the kind of aid the committee wants to give cities, so the issues will be debated before a study by the Commerce Department and HHFA is completed. President Kennedy had planned to make recommendations for consideration next year.

  The housing bill's provision would provide $100 million in low-cost, long-term loans to communities for preserving and improving transportation services, and would earmark $50 million of urban renewal funds for pilot mass transit projects.

- **The House Public Works Committee is overriding objections of the Bureau of Public Roads to legislation requiring congressional review and approval whenever a tollroad, bridge or tunnel is planned into the Interstate system.**

  At present, BPR can approve state requests to subject portions of the Interstate system to toll charges. States that do this automatically lose an amount of federal matching funds proportionate to the mileage of freeway deleted. But some states are willing to suffer this loss if they can use a "toll trap" at an Interstate interchange and thus force Interstate users to help pay for connecting state-financed tollroads.

  The proposed legislation would require approval by the Senate and House Public Works committees. BPR objects to any attempt by Congress to pass on specific highway routes.

- **Republicans on the House highway investigating subcommttee again demand hearings on the Massachusetts road scandal.** They say it "appears to be the worst in the nation." But Chairman John A. Blatnik doesn't intend to grant their request.

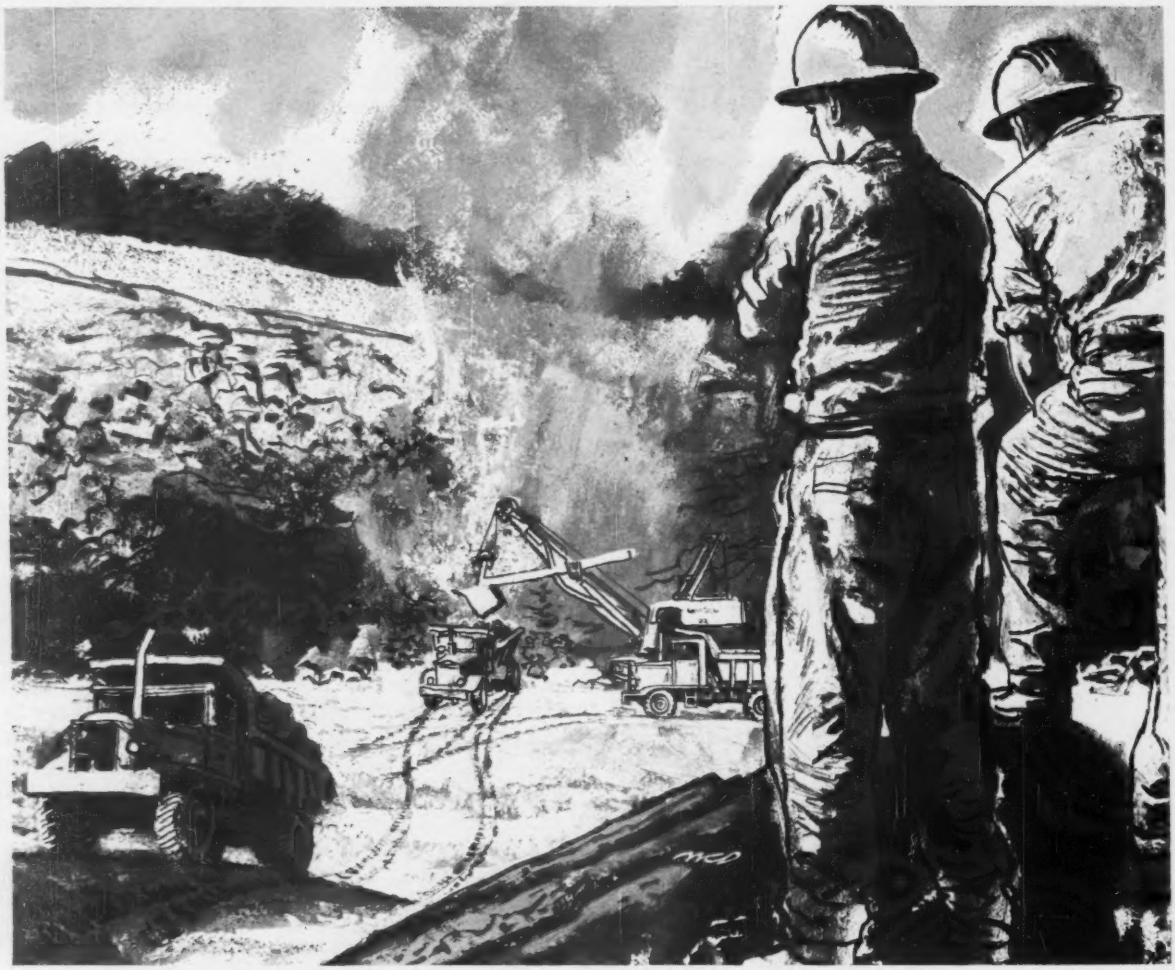
  The subcommittee's next round of hearings will deal with New Mexico and a $1-million road failure near Lordsburg. Committee investigators are working in Massachusetts, but there is no indication when hearings will begin.

  The latest Republican demand was prompted by revelations that President Kennedy, when he was a senator, and House Democratic leader John W. McCormack (Mass.) had written letters on behalf of a highway consultant who since has become a central figure in the Massachusetts scandal.

  At the time the letters were written, about two years ago, the consultant, Thomas Worcester, was under indictment for federal income tax evasion. He has since been convicted of deducting as a business expense payoffs he made to obtain work in Massachusetts.

PROTECTION IN DEPTH

How it helps cut compensation costs



Had any accidents down on the floor lately?

Working a deep cut can be dangerous. Noise and congestion team up with other hazards to cause bodily injuries and raise your insurance rates. Liberty Mutual safety engineers are experienced in studying work sites and setting up traffic patterns. They know machines and they know men, and they can help you safeguard both to improve your odds against accidents and losses.

Construction engineering is just one of the many Liberty Mutual services that add up to protection in depth. For example, Liberty also maintains a loss prevention research center, provides employee training aids, helps policyholders set up health programs for their workers. When accidents do happen, specialized medical services are available — two rehabilitation centers, a special paraplegic ward, and diagnostic aid from leading orthopedic specialists all across the country.

Last year, protection in depth helped save Liberty Mutual workmen's compensation policyholders many millions of dollars.

To find out how Liberty's protection in depth can help you save money, too, just call the nearest Liberty Mutual office.

Look for more from

LIBERTY MUTUAL

the company that stands by you

LIBERTY MUTUAL INSURANCE COMPANY • LIBERTY MUTUAL FIRE INSURANCE COMPANY • HOME OFFICE: BOSTON

Personal Insurance: Automobile, Fire, Inland Marine, Burglary, Homeowners • **Business Insurance:** Workmen's Compensation, Liability, Group Accident and Health, Fire, Inland Marine, Fleet, Crime

It's up to local areas of labor surplus (shaded) to start . . .

A Building Boom in Depressed Areas

These Are the Labor-Surplus Areas*

Alabama: Florence-Sheffield, Gadsen, Jasper.
Alaska: Anchorage.
California: Ukiah.
Conn: Ansonia, Bristol, Danielson.
Illinois: Cairo-Metropolis, Centralia, Harrisburg, Herrin - Murphysboro - W. Frankfort, Litchfield, Mt. Vernon.
Indiana: Evansville, New Castle.
Kansas: Pittsburg.
Kentucky: Corbin, Hazard, Hopkinsville, Madisonville, Middlesboro-Harlan, Morehead-Grayson, Paducah, Paintsville-Prestonburg, Pikeville, Ky.-Williamson, W. Va.
Maine: Biddeford-Sanford.
Maryland: Cambridge, Cumberland, Hagerstown.
Massachusetts: Fall River, Lowell, New Bedford, North Adams.
Michigan: Adrian, Bay City, Detroit, Flint, Marquette, Monroe, Port Huron.
Minnesota: Brainerd-Grand Rapids, Hibbing-Virginia.
Missouri: Flat River, Washington.
Montana: Butte, Kalispell.
New Jersey: Atlantic City, Bridgeton, Long Branch, Ocean City-Wildwood-Cape May.
New York: Amsterdam, Auburn, Gloversville, Jamestown-Dunkirk, Ogdensburg-Massena-Malone, Plattsburgh.
North Carolina: Fayetteville, Lumberton.
Ohio: Athens-Logan-Nelsonville, Batavia-Georgetown-West Union, Cambridge, Portsmouth-Chillicothe.
Oklahoma: McAlester, Muskogee.
Pennsylvania: Altoona, Berwick-Bloomsburg, Butler, Clearfield, DuBois, Indiana, Erie, Johnstown, Kittanning-Ford City, Lewiston, Meadville, New Castle, Pittsburgh, Pottsville, St. Mary's, Sayre - Athens - Towanda, Scranton, Sunbury - Shamokin - Mt. Carmel, Uniontown - Connellsville, Wilkes Barre-Hazleton area.
Puerto Rico: Mayagüez, Ponce, San Juan.
Rhode Island: Providence-Pawtucket.
Tennessee: La Follette-Jellico-Tazewell.
Texas: Laredo.
Virginia: Big Stone Gap-Appalachia.
Washington: Aberdeen, Anacortes, Port Angeles.
West Virginia: Beckley, Bluefield, Charleston, Clarksburg, Fairmont, Huntington, W. Va.-Ashland, Ky., Logan, Morgantown, New Martinsville, Oak Hill-Montgomery, Point Pleasant, W. Va.-Gallipolis, Ohio, Roncevert-White Sulphur Springs, Welch, Wheeling.

**Defined by the U.S. Labor Department as having "substantial and persistent unemployment."*

Policy-makers for the government's new area redevelopment program expect the bulk of almost $400 million authorized by Congress to be spent in construction.

When will this small-scale boom get under way? Probably not until later this year, for there are steps that must be taken before a specific project can be authorized under the area redevelopment program.

First, the Area Redevelopment Administration, the Commerce Department's new arm to blot out depressed areas, must determine whether a given sector of the country is eligible to receive the government aid.

The designation of the first 20 depressed areas is expected to be made any day now. Most of these will be urban areas that have long been classified by the Labor Department as areas of substantial and persistent labor surplus. Later, similar designations for areas where the main criterion will be not so much unemployment but a general low standard of living and low income levels.

The next step must come at the local level. The Redevelopment Act places great responsibility on local initiative. Local leaders must develop an over-all economic development plan (OEDP) for the area. This plan must be endorsed by the state and approved by

Washington before a project can start.

Some local leaders and some construction companies are already extending feelers to government officials to determine what types of projects might be acceptable.

Some proposed projects that seem to be getting tentative encouragement from officials include a technical training school, a sewage pump station, and perhaps an electric power generating station and a shopping center.

The Redevelopment Act authorizes loan funds of $200 million for industrial and commercial projects in redevelopment areas. Under the act, the program's administrator can make loans to finance the purchase or development of land and facilities for industrial or commercial use. Loans may be used to construct new buildings and plants, rehabilitate abandoned or unoccupied ones, and to alter, convert, or enlarge existing ones.

Each project must be supported by a combination of public and private participants. The law encourages a maximum amount of local participation and private capital in commercial and industrial projects. In no event may the federal government's share be more than 65%.

A typical project, for example, might be financed with 50% from private lenders, 10% from a state development fund, and 5% from a local development corporation—leaving 35% for financing by the federal government. Actual percentages would vary depending on the facts in a particular case.

All industrial and commercial loans are subject to a number of statutory requirements:

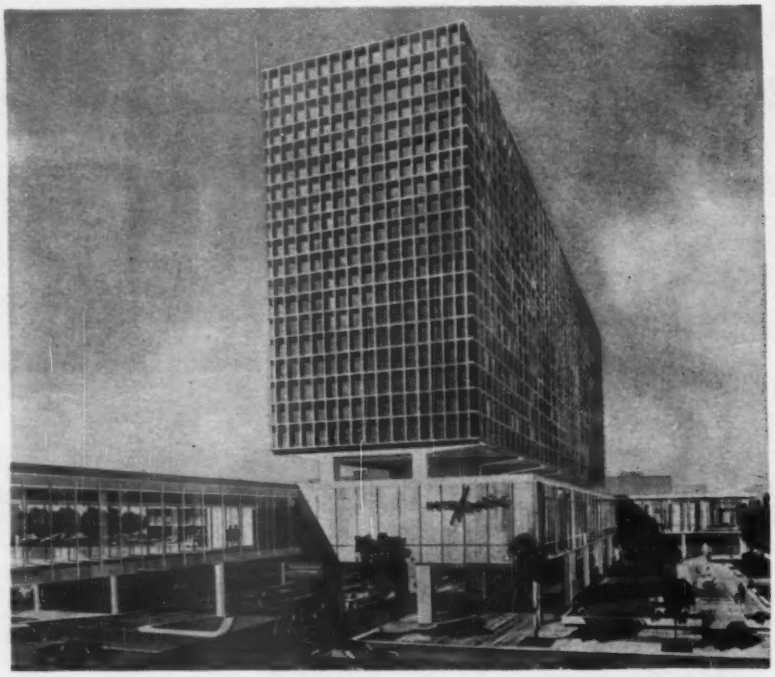
- Financial assistance won't be extended for working capital.
- Financial help will not be given for businesses or industries relocating—either completely or partially—from one area to another.
- To be approved, a project must be "reasonably calculated" to provide "more than a temporary alleviation" of unemployment or underemployment.
- Financial aid under the redevelopment program must not be otherwise available from private lenders or other federal agencies "on reasonable terms."
- A direct loan won't be made unless a participation loan is determined to be unfeasible.

One major section of the redevelopment program will include loans and grants for public facilities needed to establish or expand specific commercial plants or industrial facilities. There are $100 million in loans and $75 million in grants for public facilities.

Loan conditions are similar to those for industrial and commercial projects, except in loan periods and interest rates. Industrial and commercial loans will be made for 25 years at a current interest rate of 4⅛%. Loans for public projects will be made for 40 years at 3¼%.

Some operating problems—both internal and external—already are creeping into Washington's redevelopment program. The Commerce Department and Agriculture Department, for example, are at odds over which agency should administer the rural section of the program. A White House decision may be necessary to resolve the dispute.

Deciding which areas are depressed is also a sticky problem. "Substantial and persistent unemployment" is the criterion used now. But this doesn't always work fairly. In New York, for example, Schenectady suffers from heavy long-term unemployment. But Schenectady is considered part of the labor market of nearby Albany, which is relatively prosperous. Therefore it doesn't qualify for aid. But should the communities of Amsterdam and Gloversville be added, the over-all area would show a labor surplus, and qualify for aid as a depressed area.



Work on a 12-story hotel will start this summer as Houston's . . .

$125-Million Center Takes Shape

Houston's downtown building boom will get another boost with construction of the $6-million Hotel America, second building in the $125-million Cullen Center. Construction of the hotel will start this summer.

The first Cullen Center unit, known as the 500 Jefferson Building, includes a 21-story office structure and an adjoining five-story parking garage. This $15-million project is now under construction.

The 12.5-acre downtown site will eventually have seven air-conditioned buildings—two apartment towers, three office buildings, the hotel and a parking garage. Air-conditioned, glass-enclosed pedestrian bridges will connect all major buildings at the second floor level.

According to Welton Becket & Associates, the architects-engineers and master planners for the project, each building will be different, but there will be a unifying theme in precast concrete wall panels with exposed quartz aggregate.

The reinforced concrete frame of Hotel America will feature single-bay bents with two cantilevers carrying a 12-ft building overhang at the third floor. The precast concrete facade will form a rectilinear grid.

The precast walls of the steel-framed office building, now under construction, will present a more striking wall pattern than Hotel America. Panels from the third floor to the twenty-first floor form the frames for deep-set gray-tinted windows and backup black tempered spandrel glass. Above the twenty-first floor, solid precast panels, 6 in. thick and 34 ft high, will enclose the mechanical space and form a 4-ft parapet at the roof.

Structural engineers for Hotel America are Lockwood, Andrews & Newnam of Houston; structural engineers for 500 Jefferson are Stacy & Skinner of Los Angeles.

College and school aid bills offer this . . .

Outlook: $4 Billion in School Buildings

Bigger programs in construction of college dormitories and classrooms are on their way to probable enactment in Congress.

And if the issues of aid to parochial and segregated schools are successfully sidetracked, federal grants for public school construction and teachers' salaries will pass the Senate handily and probably squeak through the House by a handful of votes.

All this adds up to potential expenditures of several billion more dollars on construction for education in the next three to five years.

A bill providing $300 million a year for five years—$180 million in grants, $120 million in loans—for construction of college classrooms, laboratories and other academic facilities has cleared the House Education and Labor Committee and should pass the House by the middle of June. Trimming down a scholarship provision from $900 million to $300 million has removed much of the opposition, and the Senate is expected to pass it too. As a key senator put it, "Everybody loves the colleges this year."

The loans and grants would be parceled out to the states, and state commissions would distribute them to colleges on the basis of need. Colleges would match the funds $2 for $1.

States would get funds on a formula based on both the number of students enrolled in college and the number enrolled in high school. Thus states with the biggest college enrollments would get the lion's share. Under this formula, New York and California would each get $16.1 million a year, Pennsylvania, $11 million, and Alabama $3 million.

A big increase in the revolving fund for college housing loans, from $1.6 billion to $3 billion over five years, was passed by the Senate Banking Committee this week as part of the omnibus housing bill. It is expected to have fairly clear sailing in both the Senate and the House.

Much trickier is the $2.5-billion aid-to-public-schools measure. If it avoids the snares of religious and racial issues, it will spur building of an estimated 40,000 to 70,000 extra classrooms over the next three years that would not otherwise be built, depending on how much of the federal money is allocated to teachers' salaries.

The Senate bill would provide $850 million each year for three years in grants for either construction or teachers' salaries, as the state chooses. The states do not have to match the funds, but must increase local efforts or lose some of the federal money. The bill approved by a House subcommittee is about the same, except that it provides $720 million the first year, $828 the second and $936 the third for the same total.

The House bill follows the Administration's recommendation on how money is to be allocated among the states. It is based on school-age population and income-per-capita in the state. A state could get from $12 to $24 per pupil depending on the state's wealth. The Senate widened the gap between wealthy and poor states to a 3-to-1 instead of 2-to-1 ratio, but threw in more money for the big eastern states by counting parochial students even though parochial schools receive no money.

The differences between Senate and House bills at this point are considered nothing that cannot be compromised by a conference committee if both houses act.

There is also increasing support for a move to provide some construction money for parochial schools in a separate bill. This would be done by amending the National Defense Education Act, which provides loans for both public and private schools to buy equipment for teaching of science, mathematics and languages. The idea is to expand this to provide loans for construction of classrooms for those subjects, perhaps as additions to existing schools or separate wings for new schools. Presumably this would avoid the constitutional question by earmarking the money for purposes essential to "national defense."

The school-aid bill has been plagued for years by something mysteriously known as Murphy's Law which says: "If something can go wrong, it will." Thus predictions of passage are always hedged.

At week's end it looked as if a fight over aid to segregated schools could once again dump the whole program. Senate Democratic leaders predicted they would defeat any amendment denying aid to segregated schools. But now that the issue has been raised publicly again, opponents of school aid in the House may use it to defeat the bill there. Rep. Adam Clayton Powell (D., N. Y.), Harlem Congressman who usually offers the amendment, does not intend to do so this year; but Republicans may do so themselves.

The whole thing blew up when it was learned that some Democratic leaders in the Senate were considering support of "a reverse Powell amendment" by Sen. Herman Talmadge (D., Ga.) specifically forbidding the government to withhold aid from a segregated school. Sen. Lee Metcalf (D., Mont.), a staunch supporter of aid, was induced to offer the amendment but backed off when northern Democrats and Republicans reacted against it.

Even if the bill now passes the Senate intact, the issue has aroused emotions that may once again defeat school aid in the House.

BRI ponders the question . . .

How Do New Materials Stack Up?

The Building Research Institute delved into the present status of several new materials – adhesives, sealants plastics, pressure-sensitive tapes– at its 1961 Spring Conference last week in Washington.

It also tackled the problems of weatherproofing thin-shell concrete roofs, and weather protection and maintenance of public entrance doors.

Analysis of thin-shell concrete roofs indicated that weatherproofing requirements were not greatly different from those for common types of concrete decks. However, problems arising from geometry of shapes used and higher heat and moisture transmittance are more severe. The biggest complaint of designers is that manufacturers and applicators of coatings and sealants do not guarantee the formulation to be used or that it will perform as claimed.

In another session, pioneering applications of pressure-sensitive tapes were described. Included were butt joints in asbestos-cement siding for a factory, joints between plywood roof panels for a school and joints in aluminum domes.

Edmund R. Purves, former executive director of the American Institute of Architects, received the F. Stuart Fitzpatrick Memorial Award for his contributions toward unification of the various elements of the building industry.

The BRI elected Leon Chatelain, Jr., president. He is a partner, Chatelain, Gauger & Nolan, architects, Washington, D. C.

Partnership Woes Spark a Drive

A federal program for construction of civilian nuclear electric power plants is being pushed in Washington—by the Democratic members of the Joint Congressional Atomic Energy Committee, along with support from Chairman Glenn T. Seaborg of the Atomic Energy Commission.

The move is under way in the hearing rooms of the Joint Committee, which is considering proposals for the annual legislation authorizing nuclear construction.

The renewed efforts to vote federal funds for nuclear power reactors arise from conclusions of both committee leaders and Mr. Seaborg that the Eisenhower Administration policy for private industry partnership in developing nuclear electricity has fallen down.

Committee Chairman Chet Holifield (D., Calif.) says the partnership approach has "delayed the development of atomic power and allowed the privately owned utilities to dominate a program largely financed with public funds."

Mr. Seaborg acknowledged in his recent testimony to the committee that the existing program has been "disappointing."

While Republicans on the Joint Committee still defend the Eisenhower policy, the Democratic majority, with Mr. Seaborg's backing, will try to vote funds for federal construction beginning in fiscal 1962. To get their way, however, the Democrats still must win the support of President Kennedy. To date, the President has not placed civilian electric power high on his priority list of legislation for this session. And his budget for fiscal 1962 calls only for continuation of the $250 million a year for reactor construction and operation that was the legacy of the Eisenhower budget in January.

There have been no new construction starts in atomic electric power for two years. Only those projects begun some years ago will start to feed electricity into existing power systems this year and next (see tables).

There are these important reasons for the current state of affairs:

- Many leaders in Congress accept the feeling of the oil and coal industries that there is no need for forced development of atomic electric generating capability, despite the language of the 1958 Atomic Energy Act that calls for economic atomic power by 1968. That is the "national goal that Representative Holifield and his Democratic colleagues on the committee say is a pledge that should be met.
- Industry and private utilities have run into trouble on design, and in several cases snarls have developed over site locations.
- The pending litigation before the U. S. Supreme Court that will test the licensing and safety policies of the Atomic Energy Commission (ENR May 18, p. 42) is being watched to determine whether the Commission will have to set up new procedures for approving construction and operation of atomic reactors.

(The court case concerns the Fermi fast-breeder reactor at Lagoona Beach, Mich. A group of labor unions filed suit on grounds that the Commission failed to establish safety of the reactor before awarding a construction permit to the Power Reactor Development Corp., composed of Detroit Edison and 20 other private utilities and manufacturers. The legal argument has not delayed construction of the plant, but whether it will be permitted to go into operation hangs on the Supreme Court's decision.)

The delays, whatever the reasons, give critics their chance to win federal construction of commercial-sized reactors. Many of the critics have wanted a federal program all along, some on grounds that private industry could not take the financial and design gambles until A-power economy was proved, others on grounds that, like the nation's major rivers, the government-discovered atom should be developed for public power.

Representative Holifield says he predicted from the very beginning of the government-industry cooperation that the burdens imposed on a single group or groups of electric companies would prove to be too great.

"It has taken at least five years to complete the first large plant under the partnership approach," Representative Holifield says. He refers to the Yankee Atomic Electric Co. project, built by a group of New England utilities.

Mr. Holifield distinguished that project from the program of Commonwealth Edison Co. and Consolidated Edison Co., which undertook construction with their own money. The Commonwealth reactor at Dresden, Ill., is operating. The Con-Ed Plant at Indian Point, N. Y., is nearing completion. Though privately financed, these two reactors were built too slowly, Mr. Holifield believes.

He aims his attack at projects on which the federal government, in cooperation, failed even to begin construction, such as the Florida West Coast nuclear group's heavy-water-moderated, gas-cooled prototype. AEC canceled this project early in May after more than three years of research and development work.

"A number have been canceled, and others are seriously behind schedule," he said.

The Democratic majority on the committee is talking of reviving the approach taken in the Gore-Holifield bill, which passed the Senate in 1956 but was defeated in the House of Representatives.

Where A-Power Partnership Is Working

Shippingport	60,000-kw pressurized-water type, government-financed, power distributed by Duquesne Light Co.	Operating.
Dresden	180,000-kw boiling-water type, privately financed, power distributed by commonwealth Edison Co.	Operating.
Yankee	110,000-kw pressurized-water type, jointly financed, power distributed by a group of New England private utilities.	Operating.
Indian Point	275,000-kw (including 112,000 kw from conventional steam superheaters) pressurized-water type, privately financed, power distributed by Consolidated Edison Co.	Near completion.
Fermi Fast Breeder	100,000-kw sodium type, jointly financed, power distributed by Detroit Edison.	Near completion.
Elk River-AEC	22,000-kw boiling-water type, government-financed, power distributed by Elk River Rural Cooperative.	Near completion.
Piqua-AEC	11,400-kw organic moderated and cooled type, government-financed, power distributed by the City of Piqua.	Near completion.

for Federal A-Power

That legislation called for federal construction of intermediate prototype-sized plants and federal operation at the outset. It authorized $400 million, generally for construction in remote areas on public lands.

AEC Chairman Seaborg has sketched out the way he would have the federal government undertake development.

"The AEC, using fixed-price competitive bidding among private contractors, would build complete plants on publicly or privately owned utility power grids," Mr. Seaborg said. "The utility would operate the plant and buy electric power from the plant for a fixed period at some predetermined rate arrived at under competitive bidding of the utilities.

"At the end of the fixed period, the utility would be committed to purchase the plant at a price which would allow it to compete with conventional plants of the same size."

Mr. Seaborg wants to start such a program in fiscal 1963, rather than in fiscal 1962. He believes that he can get private industry to cooperate in constructing three designs authorized by Congress last year. They are the 50,000-kw improved-cycle boiling-water reactor; the 20,000-kw small-size pressurized-water reactor, and the 50,000-kw organic-moderated reactor.

Public power groups, including the American Public Power Association, want a federal program now. They are urging Congress to start by voting money now for the dual-purpose reactor at the Hanford, Wash., plutonium facility. Congress has authorized the plant, but has not appropriated the money. The Administration supports the Hanford dual-purpose installation, although critics say the electricity will not be needed once conventional power plants, hydro and steam, come into operation.

Rep. Jack Westland (R., Wash.) says the major reason for delays under the partnership program has been site selection. He says the AEC should set forth non-ambiguous site and reactor safety criteria so that industry would know what it had to do.

"If you could solve the site and safety problems," Mr. Westland says, "you could be building the Southern California Edison, the Pacific Gas & Electric, and the Los Angeles-Pasadena projects right now.

"What good would it do for the government to build reactors [at remote test sites] if they can't later be satisfactorily located on power grids?"

Some nuclear experts hold that materials problems are the true obstacles to overcome in gaining economic feasibility for the atom.

They point out that Oak Ridge National Laboratory has also run into development problems, such as those encountered when its aqueous homogeneous reactor experiments popped core tank holes. These problems are similar to those materials problems encountered by Commonwealth Edison and General Electric at the Dresden Plant.

Where A-Power Partnership Has Failed

Improved-cycle boiling-water reactor (ICBWR)	50,000-kw plant, government-financed, power to be distributed by City of Los Angeles.	
Small-size pressurized-water reactor (SSPWR)	20,000-kw plant, government-financed, power to be distributed by City of Jamestown, N. Y.	City withdrew last March.
Organic-moderated reactor (OMR)	50,000-kw plant, jointly financed.	AEC invitation for joint construction drew no private utility bids before May deadline.
Full-scale pressurized-water reactor	360,000-kw plant, privately financed, power to be distributed by Southern California Edison Co.	Utility unable to get Camp Pendleton site clearance.
D-20-moderated gas-cooled prototype	50,000-kw plant, jointly financed, power to be distributed by Florida West Coast nuclear group.	AEC terminated project due to technical and economic uncertainties.

Polar A-Power

It's cheap compared to $4.50-per-gal diesel fuel

The Navy expects to "make a profit" from nuclear power plants installed in Antarctica.

Capt. Harry Stevens, Jr., CEC, USN, announced this conclusion in a symposium on polar engineering at the 41st annual meeting of the Society of American Military Engineers in Washington, D. C., last week.

During the past five years the Navy's Seabees have built all of the facilities required by the National Science Foundation for its studies in Antarctica. Now the Navy plans four nuclear plants—two 1,500-kw units at McMurdo Naval Air Facility near the coast and two 1,000 kw units at inland stations.

According to Captain Stevens, "Economic studies indicate that nuclear power in Antarctica will actually make a profit, requiring only four to six years to self-liquidate." Reason: It costs as much as $4.50 to deliver a gallon of diesel fuel to interior stations; and one nuclear core will replace more than two million gallons of such fuel.

Foundation excavation for the first McMurdo plant was completed this past construction season. The plant will be shipped to the Antarctica this fall; it should be in operation 75 days after the ship reaches McMurdo.

A saltwater distillation plant will also be installed at McMurdo this fall. It will use steam from the nuclear power plant.

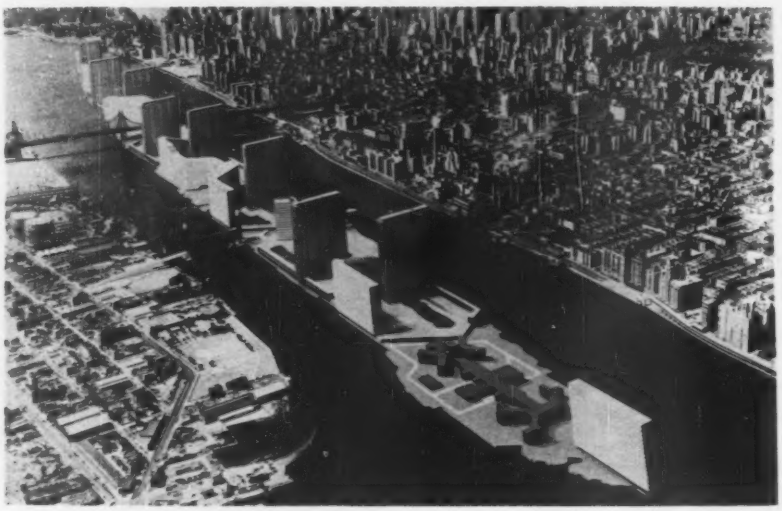
The Navy will pump salt water from beneath the ice of McMurdo Sound for distillation. A combined saltwater intake line and brine discharge line will pierce the 10- to 15-ft thickness of ice. Heat from the brine will keep the system from freezing.

The McMurdo plant will not be the first polar region nuclear plant. An Army-built 1,800-kva unit went critical at Camp Century in Greenland last October.

According to Robert R. Philippe, another symposium speaker, this plant has been in almost continuous operation since then with considerable savings in fuel cost.

Mr. Philippe dwelt extensively on the difficulty of building on the thick snow layer that covers the Greenland ice cap. The snow is comparable to soft, sugared sandstone, but does not conform to known laws of mechanics. Walls of tunnels for access between station units will gradually squeeze in. The only economical way to combat this is to overexcavate and expect after a year or so to shave off the walls, Mr. Philippe said.

For an Island Off Manhattan . . .



. . . A $450-Million Housing Dream

A $450-million plan for an apartment complex in New York City would convert Welfare Island in the East River into a self-contained community for 70,000 persons.

Located within 1,000 ft of midtown Manhattan, the long, narrow island presently contains abandoned buildings, hospitals, nurses homes and other welfare institutions. Only a geriatrics hospital would remain under the plan proposed by Victor Gruen Associates, architects for the developers.

East Island, the new name proposed, would be a pedestrians' paradise. The developers plan to ban private cars from the island's roads, which would be reserved for fire trucks, ambulances and other emergency vehicles. Residents would commute the short distance to Manhattan and Queens via subway, moving sidewalk on the Queensborough Bridge, bus and taxicab. Multi-deck parking garages in nearby Queens would store tenants' automobiles.

Outstanding design features of the proposal include:

- A concrete plaza raised 22 ft above grade and roofing a two-level structure extending over much of the 167-acre site. Schools, stores, restaurants, churches and other community facilities would be placed under the plaza.
- Apartment towers, some with serpentine plans and stepped roof levels, rising from eight to 50 stories above the plaza and four-story duplexes along the platform periphery.
- A passenger conveyor system designed to travel the island's two-mile length in seven minutes.

The narrow width of the island (about 700 ft) makes the passenger conveyor an ideal means of travel. Mounted on a continuous elevated structure adjoining the pedestrian concourse, the electrically powered conveyors would speed seated passengers between stations spaced about 900 ft apart. At each station the conveyor would decelerate to the speed of a moving sidewalk, so passengers can get on and off.

Several five-acre parks and a high school campus would interrupt the concrete platform. At one end of the island, an apartment tower for elderly tenants would provide easy access to the geriatrics hospital.

The development would sidestep at least two problems facing redevelopers in Manhattan: There's no one to relocate (the few who live on the island now could remain); and construction equipment and materials can come and go easily.

Barges could transport materials manufactured near river sites; the typical Manhattan apartment project requires truck delivery in swarming traffic.

City ownership of the land eliminates the usual write-down subsidy for land acquisition. The federal government would bear two-thirds of the estimated $35-million public capital cost; the state and the city would share the balance.

Public costs would cover construction of schools, parks, fire and police stations, libraries and other supporting facilities. The developer would finance the estimated $420-million cost for all residential and commercial construction and internal transportation facilities.

Principals in the East Island Development Corporation are Victor Gruen; Frederick W. Richmond, industrialist and financier; and Roger Stevens, real estate developer.

After the announcement of the East Island proposal, an earlier plan to build a residential community on Welfare Island came to light. Builder Francis J. Kleban of New York City revealed his plan to build Sutton City, a residential community of 2,400 units. This proposal, made in March 1959, received an "unenthusiastic" response from the City Planning Commission, according to Mr. Kleban.

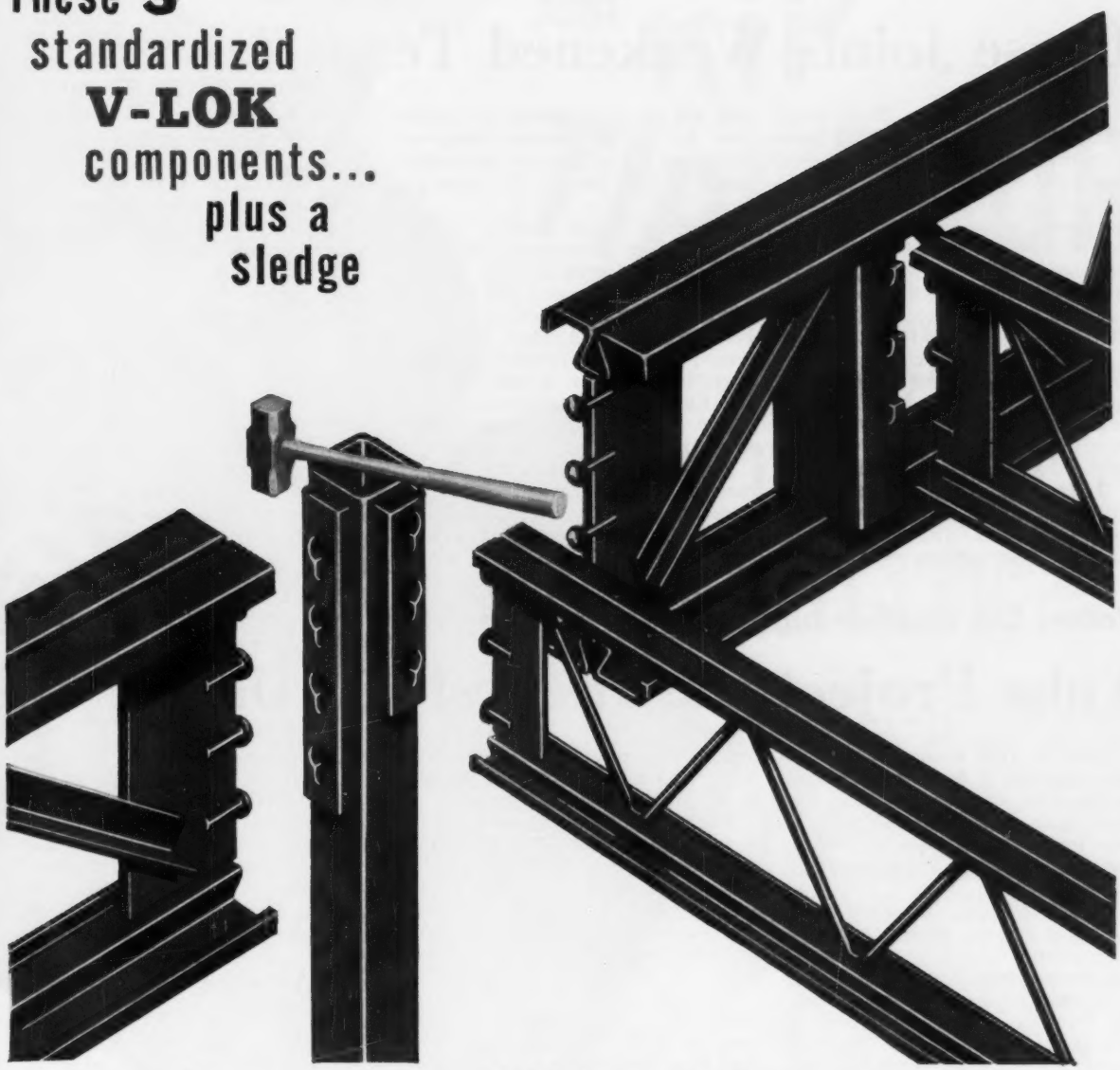
Mr. Kleban demanded that the city consider his proposal before the East Island plan. Unlike East Island, Sutton City would require no public grants, loans or tax abatement, said Mr. Kleban.

New York City architect William Lescaze designed Sutton City's four 31-story apartment towers.

Still another plan proposed for Welfare Island is Terrace City, a project designed to house over 20,000 United Nations personnel in five buildings shaped like truncated pyramids. It would also contain a 1,000-room hotel.

Prof. Percival Goodman of Columbia University, aided by six graduate students, designed Terrace City.

These 3 standardized V-LOK components... plus a sledge



...give you a strong, rigid frame in days, not weeks!

V-LOK interlocks! No field welds, no bolts, no rivets needed. Just a sledge blow seats V-LOK'S deep end connections securely. No wonder V-LOK buildings break all records for framing and roofing in! The V-LOK system is variable to meet every design and function requirement . . . V-chord sections are **nailable** for faster, easier decking.

FREE . . .
Complete design manual!

- Structural analysis
- Load Tables
- Typical framing plans, etc.

Please send me your V-LOK Design Manual

NAME _____

COMPANY _____

POSITION _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

ENR-615

MACOMBER
CANTON 1, OHIO

ALLSPANS • V-LOK • V-PURLINS
BOWSTRING TRUSSES • ROOF DECK • STRUCTURAL STEEL

Find Your Local MACOMBER Representative in the Yellow Pages

SEE OUR CATALOG IN SWEET'S OR WRITE FOR COPY

The last word on the failure . . .

Loose Joints Weakened Texas Tower

The designers of the Texas tower that collapsed in the Atlantic last January were never satisfied with its stability. Loose pin connections were a major contributing factor. These facts were pinpointed by the testimony of Theodore M. Kuss and Philip C. Rutledge of the consulting firm of Moran, Proctor Meuser & Rutledge, the concluding witnesses of the Senate Preparedness Subcommittee hearings.

Mr. Kuss told the senators that he officially reported to the Air Force on Apr. 1, 1960, that "the loose pin connections are a very serious matter since there seems to be no way of satisfactorily remedying this condition.

"Furthermore, the condition is one which will tend to worsen at an increasing rate with time. This is because the looseness induces impact stresses in the pins and pin plates, which are greater than for the non-dynamic design assumptions and will become increasingly greater as the play in the joint enlarges."

Even after added bracing was installed on the above-water section of the tower in August of 1960, the Air Force and Mr. Kuss were still trying to figure out some way to correct the loose pin situation. And when the lower bracing damage was revealed by an underwater inspection in early January, Mr. Kuss told the congressional committee, "I was almost surprised the tower stood up."

Mr. Rutledge testified that "Hurricane Donna subjected the tower to forces greater than design criteria forces. These forces broke two of the panels of bracing in the tower. The tower was in a very dangerous condition. It definitely did not have strength to resist the design criteria, and it could resist only something very much smaller."

Mr. Rutledge, however, refused to blame the construction contractor, J. Rich Steers, for poor construction on the tower. "With some minor deficiencies," Mr. Rutledge said, "the tower was constructed properly and in accordance with specifications."

At the conclusion of the hearings, committee chairman John Stennis (D., Miss.) summed up his reaction like this: "It is an amazing series of events to me. From the time it was upended until it fell there never was a time, except at short intervals when, as I view the testimony, the tower came up to anything like its intended design strength."

Voters OK another big Coast water plan . . .

Yuba Project Has Highest Fill Dam

Voters in Yuba County, Calif., last week approved a huge water project on the Yuba River that includes five dams, three powerhouses, 10 miles of main canals and 41 miles of tunnels. One of the dams will be a record-breaking rockfill.

The Californians authorized $185 million in revenue bonds to finance construction.

A report prepared earlier this year by International Engineering Co., Inc., San Francisco, estimated construction costs at $151.3 million. But the Yuba County Water Agency, which will build the project requested a $185-million bond authorization to allow for contingencies.

A construction start is possibly two years away. The engineering report said the project would take four years to complete.

The drainage area of the Yuba River covers 1,350 sq mi in northern California between the American and Feather rivers.

The river contributes about 2 million acre ft a year in runoff. But most of that wastes away, since only 300,000 acre ft of the runoff is in the summer when it is most needed.

Both the U.S. Bureau of Reclamation and the Corps of Engineers have studied the need for development of the river, both for flood control and multiple-purpose use. But federal or state action would be years away; the Yuba County Water Agency decided to act now and get an early start.

The key unit of the project would be a new Bullards Bar Dam. A rockfill structure, it will rise 630 ft to top by 93 ft the Bureau of Reclamation's Trinity Dam in California—presently the highest embankment ever built. California's proposed Oroville Dam would be 730 ft high.

The new Bullards Bar Reservoir would store 93,000 acre-ft of water from the North Yuba River and diversions from Oregon Creek and Middle Yuba. A 130,000 kw powerhouse will be on the left bank, adjacent to the downstream toe of the dam.

Water from the Middle Yuba River will be diverted by the Hour House Dam through a 3.7-mile-long tunnel to Oregon Creek. Log Cabin Dam on Oregon Creek will collect the water from the two streams and convey it to Bullards Bar Reservoir through a 1.3-mile-long tunnel.

A small dam below the Bullards Bar powerhouse will divert water through a 22,400-ft-long tunnel to a new Colgate powerhouse with an installed capacity of 114,000 kw. This plant will be located next to PG&E's existing Colgate power plant, which will continue to operate.

A new 35,000-kw powerhouse at Narrows will be constructed just below the existing Englebright Dam. Diversion dams will be constructed to irrigate about 500,000 acres.

Bullards Bar, Colgate, Oregon Creek and Middle Yuba diversion projects will cost $124.8-million; New Narrows powerhouse, $7 million; irrigation diversion dam, $6.3 million and main canals and drainage $13.1 million.

U.S. Advances Road Cash; $818 Million Goes to States

President Kennedy has ordered another speedup in the allocation of federal-aid highway money. The government is releasing immediately $818 million in highway money that ordinarily would have gone out July 1.

States with the jobs and the matching funds ready can therefore get a six-week head start on the summer construction season.

This makes the fourth time in a year that the U. S. has opened its road purse sooner than scheduled. President Eisenhower began the pattern last year, and it has been followed in every quarter since.

Here are the states that get the biggest chunk of this disbursement: California, $72 million; Ohio, $46 million; New York, $41 million; Illinois, $38.8 million; Texas, $38.6 million; Virginia, $29 million; New Jersey, $23 million; and Missouri, $22 million.

Just RIP TIP and POUR

You don't have to mix these new economy blasting agents

DU PONT NILITE® 101 AND 202

The minute you tear the corner off your first 50-lb. bag of "Nilite" 101 or higher-density "Nilite" 202, you'll enter a new era in blasting.

Now at last you have two low-priced, free-running blasting agents that give you Du Pont quality performance, shot after shot.

You don't mix "Nilite" on the job. You don't mix it at all. Just rip open the bag and pour it into any hole—small, medium, large—from 2″ diameter up. No clogging, no bridging in the hole.

No clouds of dust, and no ingredient to cause headaches. No messy oil-stained bags.

But easy loading is only part of the story of "Nilite." For full data on rock-breaking power, better propagation, greater safety and other advantages, send for our new fact sheet on "Nilite" or call your Du Pont distributor or representative. Start saving on your blasting . . . soon. Du Pont, Explosives Department, 6440 Nemours Building, Wilmington 98, Del.

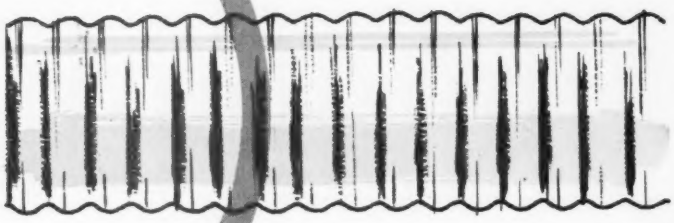
Flows freely even in holes as small as . . .

DU PONT
REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

NILITE®

Armco Pipe, installed in 1909.



Armco Corrugated Metal Culverts OUTLAST THE ROAD!

Armco Pipe, installed in 1911.

Installed 50 and 52 years ago respectively, these Armco Corrugated Metal Pipe culverts are still in good shape although the old road has been abandoned in favor of a new, wider and safer highway.

Steel

for strength, economy, durability

If desired, these drainage structures in Butler County, Ohio, can be excavated and reinstalled elsewhere with assurance of many more years of service.

Many engineers have long recognized the advantages of the flexible strength of Armco Corrugated Metal Structures, their durability under rigorous conditions, and the wide selection of sizes between 8-inch and 24-foot diameters. Contractors like the economy, ease of handling and installation of Armco Pipe and the helpful service of their Armco Sales Engineer. For more data, write: Armco Drainage & Metal Products, Inc., 5221 Curtis Street, Middletown, Ohio.

ARMCO Drainage & Metal Products

Delta Girders for a Short Steel Span

By Homer M. Hadley

Designers incorporated two unique "delta girders" in a single-lane logging bridge over Taylor Creek near Seattle, Wash. Each of the steel girders is 75 ft long and is designed to carry an occasional 70-ton log loader on a 74-ft span.

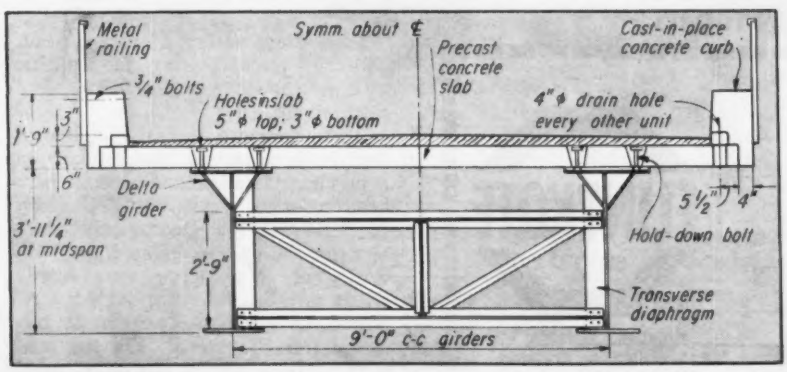
The girders look clean and attractive because there are a minimum number of stiffeners for bracing and stiffening the web and compression flange. There are but six visible stiffeners in each girder—four on the inside at cross-frames and two on the outside at bearings.

Instead of stiffeners, each girder employs a pair of corner plates that span the reentrant corners between web and compression flange to create a double-celled triangular box or shaft, continuous from one end to the other (see drawing). The ends are closed off and sealed with triangular plates.

This elementary, self-bracing triangular box practically fixes the upper compressive portion of the web, holding it rigidly against lateral or torsional displacement. At the same time, it provides three continuous supports for the top flange plates, which then can have a width and lateral stiffness proportionate to span requirements; e.g., say 4 ft on a 200-ft span.

The corner plates not only stiffen the web and top flange but act effectively in resisting longitudinal bending, since their metal constitutes a substantial portion of the transverse section.

The Taylor Creek bridge, owned by the Water Department of the City of Seattle, comprises the 74-ft span over the creek plus one 46-ft prestressed concrete girder span. Both spans have



TWIN GIRDERS support precast deck slabs; span has four transverse diaphragms.

***Homer M. Hadley**, veteran Seattle structural consultant, is noted for his outspoken views and his willingness to advance new concepts in bridge design.*

NEWS FROM FLINTKOTE:

SPECIALLY DESIGNED PAVING PRODUCTS

For sealing joints, For surface sealcoating, For concrete bonding,

ASK FOR FLINTKOTE ENGINEERING DATA SHEETS ON:

M-200: Fast setting, polymer type joint and crack sealer for concrete pavements—cold applied. Offers best resistance to jet aircraft heat and blast operations under wide temperature variations. Meets Interim Fed. Spec. SS-S-00200a.

H-100: Modified polymer type, two-component compound for concrete pavement and structure joints in highway and non-critical airfield areas. Has many advantages over other hot or cold sealers.

FLINTSEAL® (Regular—SS-S-164) and (Jet Fuel Resistant—SS-S-167b): rubber bearing, hot-poured types for durable sealing of joints and cracks to prevent leaking and provide resistance to wear under repeated freeze-thaw cycles. Meet Fed. Spec. for both types.

FLINTAR® (Regular—R-P-00355a) and (Rubberized): Coal tar pitch emulsions for sealcoating and slurry coating bituminous driveways, parking lots, roads, airfield pavements. High resistance to petroleum fuels, oils—extends life of black-top. Meet all specifications.

FLINTCRETE*: Polysulfide/epoxy compounds (grout and binder) for bonding old and new concrete in restoration and repair of pavements and structures, bonding curbs, traffic markers, skid-proofing and many other adhesive requirements. Procedures fully detailed.

*T.M. OF THE FLINTKOTE COMPANY

SEND COUPON BELOW OR WRITE TODAY:

Paving Products Section,
The Flintkote Company,
P.O. Box 157, Whippany, N.Y.

Name_____

Firm_____

Address_____

City_____ Zone____ State____

Please send data on_____

FLINTKOTE®

America's Broadest Line of Building Products

STRUCTURE is designed for composite action between girders and roadway slabs.

precast concrete slab decks and both are designed for composite action between girders and slabs. Each precast deck panel is 6 in. thick, 15 ft 4 in. wide and 7 ft long, axially of the bridge.

To ensure composite action, the upper surfaces of the girders were shop roughened, as were the overlying surfaces on the bottom of the precast slabs. Each prestressed girder was roughened by scoring the top surface transversely. Numerous weld beads, hold-down nuts and spacer blocks were used on the steel girders.

In both cases, the concrete deck slabs rest on spacer blocks that hold them the desired distance above the tops of the girders. Spaced hold-down nuts were fastened to the girder tops. Thick marginal felt strips mounted longitudinally on the girders compressed under the deck slabs and prevented lateral escape of mortar.

Holes in the concrete deck slabs coincided with the locations of the hold-down nuts. Workmen placed the slabs and installed hold-down bolts and washers. A 1.5 to 1 coarse sand-cement mortar was forced through the holes in the slab to fill all the void spaces beneath. Five-inch transverse spaces between adjacent slabs were filled with concrete.

Final steps included casting heavy curbs in place, placing an asphaltic wearing surface and installing metal side railings.

Tests demonstrating the ability of weld beads to provide composite action between steel and precast concrete have been reported previously (ENR May 26, 1960, p. 45). Recent exploratory tests on the delta section at the University of Washington were highly satisfactory but have not yet been reported; no weaknesses peculiar to this design were discovered. On the contrary, stiffness and rigidity were found to be outstanding.

New Joy TDM-B1 swing boom trac-drill has complete power positioning and automatic hose reel

The new Joy TDM-B1 Trac-Drill with swing boom features full range power positioning of the drill. In swinging to any drilling angle from vertical to horizontal, there are no manual adjustments. The exclusive new hose reel trains air hose in all drilling positions, eliminating fouling—saving frayed hose and tempers.

Another exclusive feature, a new control arm swings the drilling controls with the boom. It puts the operator up front, where visibility for spotting is best, and then can be moved to any desired position—operation is independent of the boom.

The TDM-B1 carries Joy's dependable 450-DR Dual Rotation Drill. This drill provides hammer-free rotation for fast steel changes, plus a strong assist to normal rifle-bar rotation when needed.

The Joy TDM carrier is the most versatile machine in its class, and now offers you the option of either the new Swing Boom model, or the universal U-Bar machine. For complete information on the Joy TDM Trac-Drill, see your Joy distributor or write for Bulletin 2671-24.

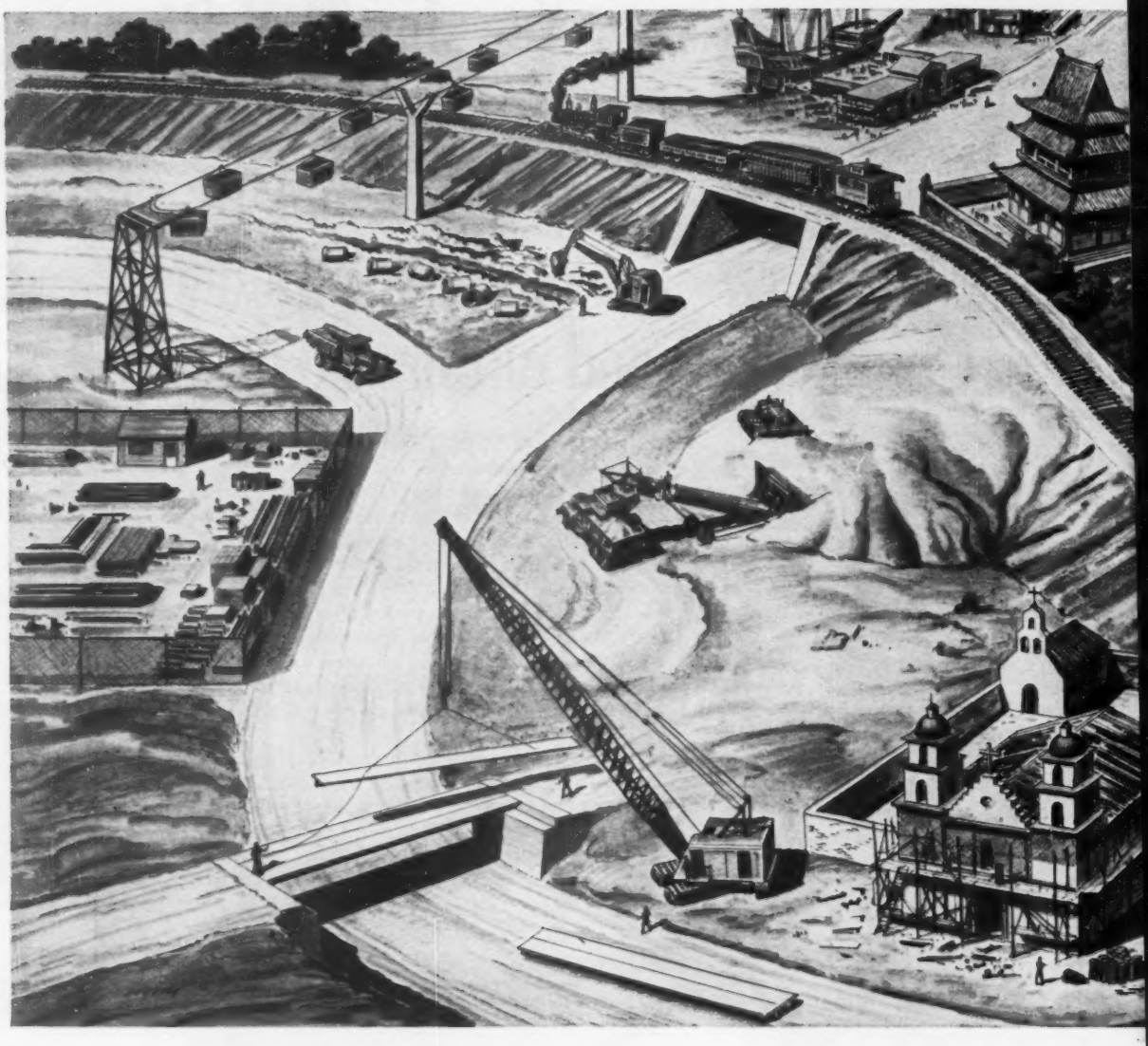
JOY CONSTRUCTION EQUIPMENT IS SOLD AND SERVICED BY THE JOY DISTRIBUTOR IN YOUR AREA

JOY

Joy Manufacturing Company
Oliver Building, Pittsburgh 22, Pa.

In Canada: Joy Manufacturing Company (Canada) Limited, Galt, Ontario

Portable Compressors	Trac Drills	Tungsten Carbide Rock Bits	Hand-Held Rock Drills



Past and future come to life... through construction skill and

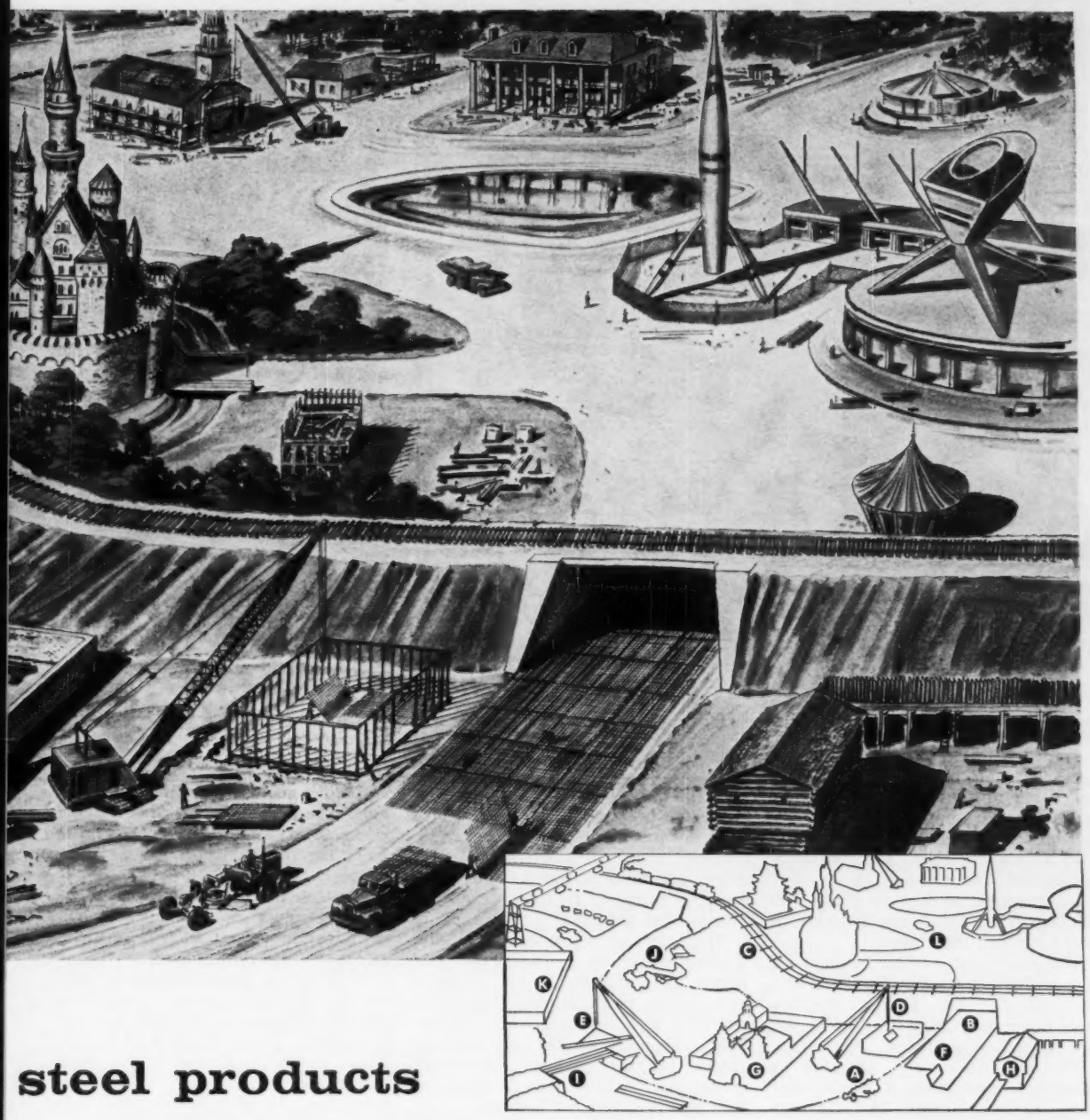
It takes more than a magic wand to build modern amusement centers. A far cry from the kiddy park of yesterday, the new educational park calls for vision, logical planning, coordination, construction skill and ton after ton of construction materials — including many different steel products.

CF&I — a nationwide steel company — supplies a number of dependable steel products for construction of amusement parks like the one shown above.

CF&I Grader Blades and Cutting Edges (A) level and smooth the craggy ground, converting an almost inaccessible wasteland into a workable area. *CF&I-Clinton Welded Wire Fabric* (B) adds extra strength to concrete roads, culvert pipes, buildings and parking surfaces, making the concrete more durable and crack-resistant.

The model train, like so many of today's fast-moving railroad cars, rides on *CF&I Rails* (C). Cable cars glide through the air on *CF&I-Wickwire Rope* (D), which is also widely used on cranes, trench hoes and carry-alls. Wickwire Ropes are selected because they last and have extra-high breaking strength.

The motto of contractors building such huge projects should always be: safety first. Consequently, they specify *CF&I-Wickwire Wire Rope Slings and Sling Attachments* (E) for hoisting jobs. And they insist on *Cal-Tie Wire* (F) for fastening road fabric, because this quality CF&I wire is available in handy reels which eliminate the hazards of tying with shoulder coils.



steel products

CF&I Lok-Twist Stucco Netting **(G)** strengthens the walls of many structures, while thousands of *CF&I Nails* **(H)** will hold wooden structures tightly for years.

CF&I Prestressed Concrete Strand and Wire **(I)** is chosen to give tensile strength to the prestressed concrete girders. And *CF&I Industrial Screens* **(J)** accurately classify sand and gravel.

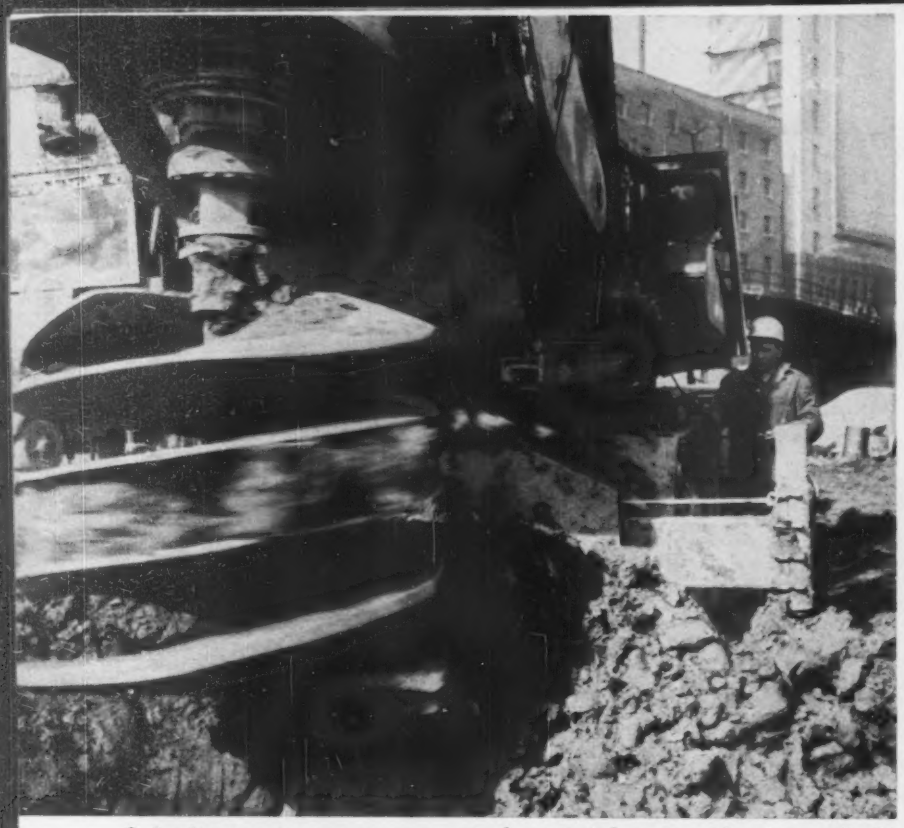
CF&I-Realock Fence **(K)** protects equipment storage areas and is often erected around the entire park. Also, many of the trucks and service vehicles are equipped with *CF&I-Wickwire Automotive Springs* **(L)**.

On large and small construction jobs all over America, you'll see CF&I Steel Products. They can be counted on to do the job safely and at reasonable cost. Get complete information about any CF&I steel product by calling our nearest sales office, or write for Catalog G-104 "CF&I Steel Products for the Construction Industry." 7980

THE COLORADO FUEL AND IRON CORPORATION

DENVER • OAKLAND • NEW YORK

CF&I STEEL MADE IN U.S.A.



Spinning auger spews excavated material at top of caisson shaft.

Truck-mounted drill churns into

Big Augers Go Deep So Buildings

Giant augers and special rigs have drilled big caissons 115 ft to bedrock in Chicago to support twin 60-story apartment buildings.

In a crash program, the contractor constructed 148 caissons up to 5 ft 6 in. diameter, in four months. The job began last December 9 and continued through the winter.

The contractor worked 68 men on two 12-hour shifts per day, five days per week. He worked three drill rigs, each powerful enough to handle the job's largest auger flights (78-in. dia.).

The two smallest rigs, mounted on four-axle chassis with 12 pneumatic tires, can drill to depths of 110 ft and 90 ft, the third machine can drill to 150 ft. It is a 51-B Caisson Drill Rig designed and built by Case Foundation Co., Roselle, Ill., the contractor on this job.

The 51-B used for the first time on this project, is mounted on a Bucyrus-Erie 51-B undercarriage with swamp tracks. It is powered by a 370-hp Caterpillar D-375 torque convertor diesel engine turning a 26-in rotary (Gumbo Buster) drill table, complete with forward-reverse gear. Uuder normal conditions it operates the auger between 750 and 800 rpm.

The 120-ton machine cost more than $325,000, according to Grover C. Gauntt, vice president of Case.

All 148 caissons were carried to bedrock 108 ft to 115 ft below ground level, with rock penetrations up to 4 ft into hard dolomite limestone.

Three different water strata, saturated granular materials and large boulders near the bottom of caissons complicated the work.

The site is separated from the Chicago River by a quay wall. The upper 20 ft of material is a saturated granular material dredged from the riverbed, with customary obstructions. The remainder of the material includes hardpan, granular formations containing boulders and a strata of rock flour silt near the bedrock.

As the caissons advanced and the augers removed the overburden, the water trapped on top of the bedrock rose nearly 60 ft up the shaft. To prevent this saturated silt from flowing into the shafts, the lower 60 ft of each caisson was formed inside of steel barrels up to ½ in. thick, and cored into the bedrock.

These core-barrels were fabricated with a ¾-in. cutting edge of high alloy steel and structural steel rings to withstand hydrostatic pressure upon dewatering. The drill rig rotated them under tremendous torque power and a downward crowd of several tons.

Coring continued to a sufficient penetration into the bedrock to shut off the artesian water. The shafts then could be de-watered without loss of ground and kept substantially dry while workmen removed and inspected the limestone, tested the bedrock and concreted in the dry.

Thirteen of the caissons had to be drilled through an abandoned system of freight tunnels about 8 ft in diameter and 50 ft below ground.

Each of the apartment towers rests on 40 concrete caissons arranged in three concentric circles with radii of 16 ft 9 in., 23 ft 6 in., and 54 ft 8 in. There are eight caissons in the inner ring supporting the core wall of the tower, and 16 each in the other two rings, which support columns.

Since the bottom 60 ft of all 80 tower caissons are encased in steel shells, they could be smaller in diameter than the remaining upper portion. Caissons in the inner ring are 66 in. dia for the upper portion and 54 in. dia for the bottom 60 ft of shaft. The middle ring has shaft diameter of 48 in. top and 42 in. bottom, while the outer ring caissons have a 60-in.-dia shaft at the top and 52 in. at the bottom. A change in design of the west tower to accommodate a TV antenna framework on the roof, meant widening the interior ring of caissons from 66/54 in. to 72/66 in.

The other 68 caissons are constant

bedrock of riverfront site.

Can Go High

Biggest rig on job can turn a 66-in. auger at 150-ft depth.

diameter. Four are 36 in. dia, nine are 30-in., and the remainder are 24-in. They were keyed 6 in. into the limestone.

In the best day's work, four of the 66-in. top dia caissons were drilled about 110 ft to rock and concreted in two 12-hour shifts.

To drill one of the 66-in. (top dia), 54-in. (bottom dia) tower caissons, the crew moved its rig over a surveyor's stake marking the center point of the caisson. Using a hand level, they plumbed the rig tower and "kelly pole." The auger, attached to the bottom of the kelly pole, was centered over the stake.

They drilled the first 20 to 30 ft of caisson oversize (78-in. dia) and installed a top casing of scrap metal to retain the loose granular material between ground surface and stiff clay.

After the engineers established marks on the 78-in. casing, the drillers changed to a 66-in. auger. They centered it and drilled to within about 60 ft of bedrock. This length of caisson shaft was not cased.

A 60-in. auger replaced the 66-in. auger and the caisson was drilled to bedrock or as near to bedrock as the overlying boulders permitted. Workmen then removed the 60-in auger, lowered a 60-ft length of 54-in.-dia core barrel into the hole, and cored it into the bedrock.

The core barrel remained in place. After it was dewatered, workmen with jackhammers and a muck bucket removed the rock inside the caisson. Engineers then inspected the bottom of the caisson. In some tower caissons a core 2-in. wide and 8-ft deep core was taken to insure a minimum thickness of sound solid material.

Workmen packed the area between the 54-in. core barrel and the 60-in. drilled hole solid with wood wedges. Steel rods driven through precut holes in the top of the barrel held the wedges in place and also centered the core barrel.

Using transit mix concrete, workmen filled the 54-in. core-barrel and the 66-in. drilled hole above it. After the caisson had been concreted up the bottom of the 78-in. casing a 66-in. thin steel shell liner was lowered into the hole, centered and held in correct position by wedges between it and the 78-in. casing.

Finally, the 78-in. casing was extracted after the completed caisson had cured a minimum of 24 hours. This method is the patented "Case Method."

The upper sections of caissons are reinforced with high strength vertical dowels, assembled into cages on the site and set in place. In some cases, this vertical reinforcement extends to the bottom of caisson.

Transfer of stresses from the reinforced concrete building columns into the caissons is provided by welding the vertical reinforcement to a heavy base plate. This 2-in.-thick plate is welded to the tops of the caisson dowel bars and to the bottoms of the high strength column reinforcement—using full-penetration butt welds.

Material excavated from the caissons was moved to the riverside by a 3-cu-yd tractor shovel. It was loaded by crawler crane and 1.5-cu yd bucket onto a barge —about 600 cu yd per load—and towed down the Chicago River to provide fill material for an industrial plant expansion.

About three barge loads were moved per week. They were loaded out at night, to free the crane for other operations during the day.

Bertrand Goldberg and Associates are architects in charge of design and construction.

The $36-million project (ENR Mar. 10, 1960, p. 23) is sponsored by the Building Service Employees International Union of the AFL-CIO.

How AMERICAN CYANAMID'S ACCOMITE® helped break a trail through Donner Pass!

American Cyanamid explosives are currently lending a hand as the joint construction venture of Briggs, Conley and Dennis drive a hard rock, divided freeway across the Sierras at famed Donner Summit. One of the last links in Interstate 80, connecting Sacramento and Reno, the 7 mi. job involves over 3,500,000 cu. yds. of rock excavation (chiefly live granite), in a steep, densely wooded area.

Initial shooting used ammonium nitrate detonated with a single stick of 40% gel and stemmed with 7 ft. of drilling dust. Fragmentation was poor with lots of unmanageable rock, so contractor considered shifting to blasting gel entirely. With 2,500,000 lbs. of explosives estimated, this would have added a quarter million dollars to the job cost.

Cyanamid's nitro-carbo-nitrate mixture, ACCOMITE was suggested. Test results on this economical, relatively insensitive blasting agent were highly satisfactory and it has since been used exclusively. Breakage is perfect, equipment* is kept busy and job is progressing in record time. Average shot is a 14,000 to 18,000 cu. yd. block, drilled with 22', 3" diameter holes on a 6x6 6x7 or 7x7 pattern.

Cyanamid offers a complete line of dependable high quality explosives, promptly delivered with distributor service coast to coast, plus cost-cutting assistance in their best use. For complete information, contact our nearest office.

Distributor providing fast, dependable service on this project: Alpha Industrial Supply, Nevada City, California.

*Equipment includes: 3 Bucyrus-Erie 88 B and 3 Northwest 80 d shovels, 16 Euclid end-dumps and 10 D8 ½ Caterpillar dozers.

AMERICAN CYANAMID EXPLOSIVES

AMERICAN CYANAMID COMPANY

EXPLOSIVES AND MINING CHEMICALS DEPARTMENT

30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

Explosives • Electric Blasting Caps and Accessories
Blasting Agents • Chemical Grout • Mining Chemicals

A gabled space truss frames the 83x44 ft area with steel weight less than 6 psf.

Folded-Plate Space Truss Spans Gym

A steel space truss satisfies some testy architectural requirements in the all-purpose room of the Laurel School in Menlo Park, Calif.

Architect Kingford Jones of Menlo Park wanted a low building, column-free interior 44x83 ft, and a longitudinal wall free of pilasters. And the roof structure had to be designed within a tight budget.

Trusses or tied arches would have required lower chords or tie rods, which would have interfered with basketball. Rigid frames would have had columns projecting either into the room (thus presenting a hazard to the children at play) or out from the long exterior wall (thus destroying the architect's design for a plane-surfaced wall).

Moreover, the lateral bracing system, which forms an integral part of the space frame, would have required additional members in a rigid frame system.

The space frame satisfies both the architectural requirements and the demand for economy. Steel weight is less than 6 psf.

• **Designed like a folded plate**—Structural engineer Marvin A. Larson of San Francisco designed the space frame for the structural action of a folded plate. Each truss forms the plane of one-half of the gable roof.

Purlins span from 8-in. reinforced masonry bearing walls to the center ridge beam, which acts as a common compression chord for both trusses. Purlin reactions on the ridge beam load each truss with one-quarter of the total roof load. Masonry piers centered at the end walls resist the truss reactions.

To reduce the bending moment in the purlins, the engineer designed the truss members to connect to the bottom flanges of the purlins. Since the purlins act as compression verticals in the truss, the eccentric connections produce an upward bending moment, thereby partially offsetting the downward bending moment.

Wind and earthquake forces required no increase in member sizes designed for vertical loading because of the allowable one-third increase in allowable stresses for combined loading. Wind load was 15 psf; roof live load, 16 psf for purlins and 12 psf for the roof as a whole. Seismic design force was 13% of the structure's dead load.

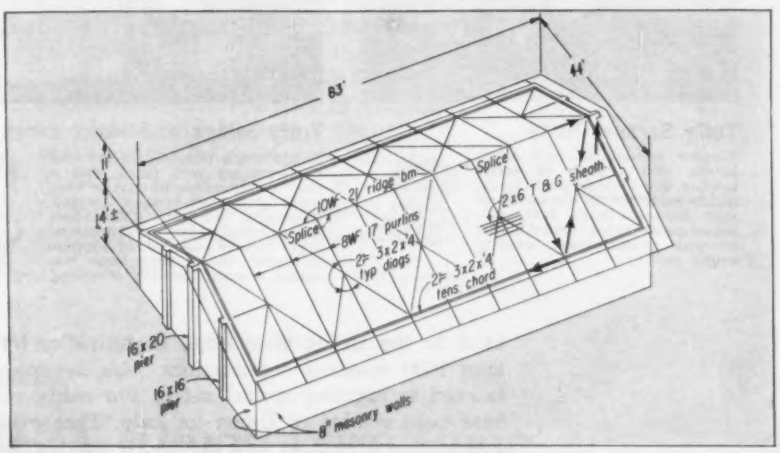
• **Built with camber**—To compensate for dead load deflection, the erector had to jack camber into the ridge beam after the entire frame had been assembled. This enabled steel workers to bolt the unconnected ends of tension diagonals, which were detailed short.

Steel erection started with the ridge beam, which required the only temporary shoring on the job. Timber shores supported the ridge beam near the third-point splices. The purlins were then bolted to the ridge beam and seated on steel-angle bearing plates anchor-bolted to the masonry walls. The tension chords then went into place just inside the walls.

The contractor grouted the pockets left for the purlin bearing seats, thus forming a connection designed to transmit lateral forces from the wall into the roof truss. The bearing walls are reinforced with grouted reinforcing bars (#4 bars in the horizontal joints and #5 verticals in the masonry cores). They are spaced at 32 in. c-c.

After the framing had been erected, the workmen jacked a ¾-in. maximum camber into the ridge beam. This pulled in the exterior walls and allowed the steel workers to bolt the unconnected ends of the web angles.

General contractor is Harrod & Williams of Sunnyvale, Calif.; San Jose Steel Co. of San Jose fabricated and erected the structural steel.



MAIN STRESS PATHS of space truss under vertical loads follow arrows. End walls act as diaphragms to resist lateral loads.

Union Wire Rope

Tough-job "champs"--Union Wire Ropes and Slings

"Real Gone" from Beatings on the Drum

Even under normal operating conditions, drum wear gives wire rope severe punishment. This wear concentrates at the cross-over points and at the flange. Excessive drum crushing results from operating on small drums, excessive loading and poor winding. Smooth drums are not recommended. Here are typical "drum beatings"; cross-over wear; cross-over crushing on drum; drum crushing from poor winding; drum-crushing from small drum.

Although drum wear cannot be eliminated, its effects can be greatly reduced. Under properly engineered procedures, two and three times the service can be obtained from the same line by improving drum conditions. Union Wire Rope Engineers will help you with this problem.

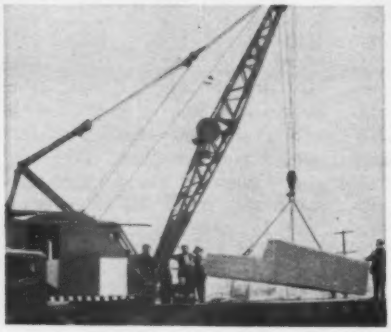
On the "Blink" from a Kink

This open kink resulted from mishandling of rope. Guard against kinks by proper winding on the drum. Never pull a loop smaller. Always enlarge it, then straighten out the rope.

Each Union Tuffy is Engineered to Meet a Different Tough Job

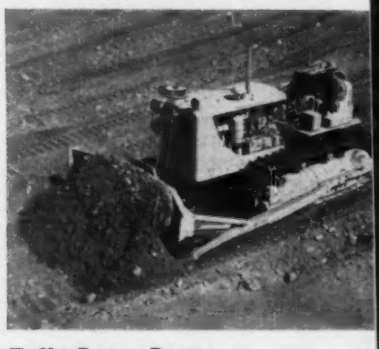
Tuffy Scraper Rope

Flexible enough to take sharp bends; stiff enough to resist looping and kinking when slack; highly resistant to the shock of load impact — that's Tuffy balanced construction. Mount a reel on your scraper—save wasting sound rope.



Tuffy Slings and Hoist Lines

Slings are a patented, 9-part machine-braided wire fabric that is next to impossible to knot or kink. Hoist lines have built-in strength, toughness, flexibility. Balanced—a top-performing team for handling every type of material. In addition to Tuffy, Union Wire Rope furnishes a complete line of slings.



Tuffy Dozer Rope

Mounts right on your dozer in a 150′ reel. When rope shows wear, just feed through enough to replace the damaged part. Saves rope, gives you a bonus of extra service. Also available in 300′ and 500′ reels.

Look to the Union Wire Rope Organization for "Right Rope" Service. Union has more than 1600 standard constructions, *plus* the special Tuffy family of wire ropes and slings tailored to exacting special needs. For many years people with special wire rope needs have been coming to Union for help. That's the way the Tuffy family grows. Our research laboratory is at your service. If we don't already have it, we'll design and fabricate just the rope or sling you need. And you'll be sure of Union strength, Union flexibility, Union job-tested quality. Call your Union distributor—see the phone book Yellow Pages.

Tuffy Tips

New steels are born at Armco

keep the title longer with proper handling.

Burned on a Frozen Sheave

End of the line came quickly for this rope as the result of operating over a sheave that did not turn. Note the exceptionally heavy abrasion on one side of the rope. Sheaves should be checked thoroughly and often.

How to Measure Rope Diameter

To get the most service, efficiency and safety out of wire rope operation, rope and sheaves must be precisely fitted to each other. There's only one right way to measure rope diameter: use machinist's calipers and be sure to measure the *widest diameter.*

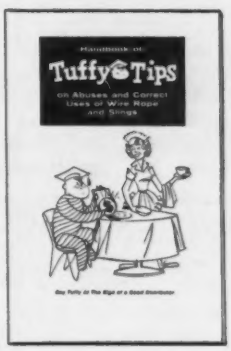
A slight shift of the rope in the calipers, as shown above, will give you a misreading which would result in ordering an undersize rope. Note that the measurement at right shows 1/8" under correct diameter. Be sure to double-check every time!

Tuffy Dragline Rope

High abrasive resistance and super flexibility. Gives long service, dependable action in handling any material—wet or dry dirt, sand, gravel, rock, minerals. Rides smoothly on grooves—hugs the drum when casting for full load.

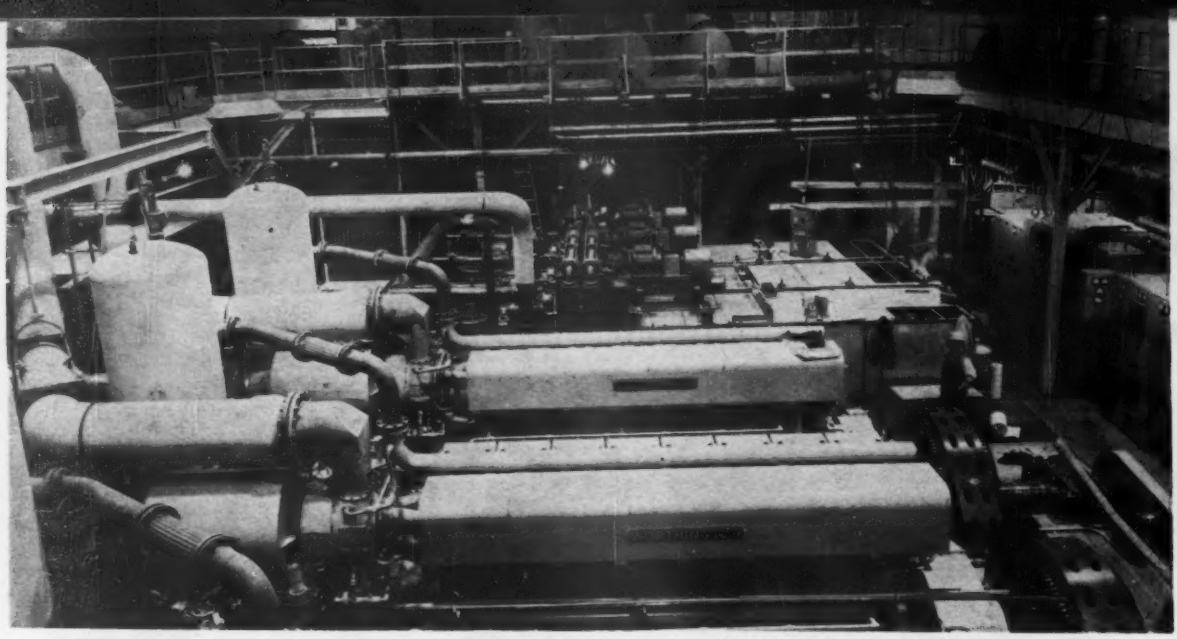
Union Wire Rope Handbook of TUFFY TIPS...Free!

The "Tuffy Tips" shown here are quoted right out of Union's handbook. In it there are dozens of other priceless hints on the correct use of wire rope. The common abuses and how to avoid them. How to save costly injuries. Maintenance tips. The proper fittings and how to apply them. Recommended sizes. Many other facts and suggestions that will cut down your rope costs and help you get out of wire rope the full service we build into it. No charge. Write Union Wire Rope, Armco Steel Corporation, 2228 Manchester Ave., Kansas City 26, Missouri.



2-61

ARMCO Union Wire Rope



First completely hardened diesel-electric power plant . . .

Titan's Powerhouse: Designed to

A powerhouse that will keep going through all but a direct hit from a nuclear weapon is now serving a battery of three Titan missile cells at Lowry Air Force Base near Denver. It's the first completely hardened underground powerhouse in the U. S.

This self-contained plant—four 1,000-kw diesel-powered generators—is designed to operate through high overpressures caused by either attack or missile malfunction. Its ventilation system can filter out radioactive particles; its cooling system stores energy in ice banks to draw on during the launch period.

Blast and shock resistance is divided into three separate parts or zones: an 18-in.-thick concrete dome, a 1,000-ton inertia block supporting the generating equiment, and shock mounting engine for appurtenances and auxiliaries. All zones are completely separated structurally.

A basic concept in design of hardened facilities is structural separation of the shell of the underground building from its contents. In this case, the dome is designed to settle slightly under blast pressure.

Once its narrow (8-ft) footings settle even slightly, the superimposed soil arches. That reduces the load on the dome so that only a radial load is transmitted to the shell. Thus, the shell does not have to be designed for flexure.

Since the designers, Daniel, Mann, Johnson & Mendenhall and Associates, expected the dome to settle independently of its contents, the only equipment they've attached to it is a 10-ton-capacity radial crane. A rattle space of at least 1 ft separates the dome from all other equipment so that it can settle harmlessly.

Shock-mounting the contents of the power plant raised difficult design problems—problems the designers had to attack without precedents to guide them. For example, what intensity of overpressure should they design to? Would it be cheaper to shock-mount the whole floor system or to shock-mount each piece of equipment individually? They had no reliable estimates.

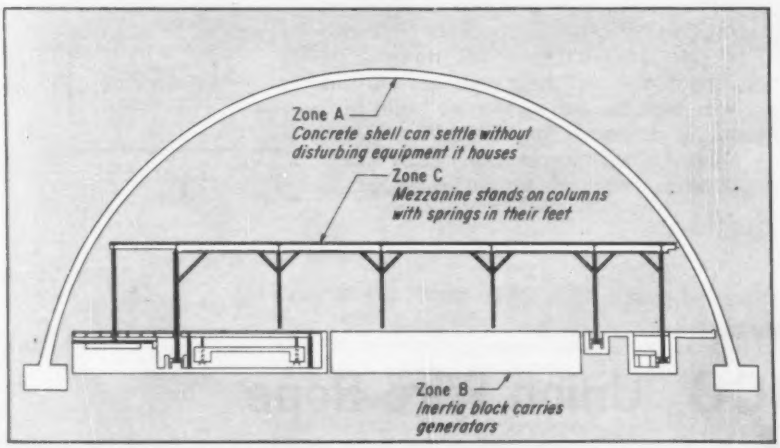
The designers' studies indicated that shock-mounting the entire floor system would be more economical, but on this first power plant the equipment was treated separately. Later underground power plants have slightly different designs.

At Lowry, the engine-generator sets are not shock mounted. Instead, the four units are mounted on a single 1,000-ton inertia block of solid concrete; the engines themselves are rugged enough to withstand shock.

The engine appurtenances and auxiliaries are shock mounted in two ways: Those on the main floor of the powerhouse are placed on a concrete slab supported by heavy steel coil springs; but equipment on the 16-ft-high mezzanine is handled differently, although designed for the same amount of shock resistance.

Mezzanine columns penetrate the floor and rest on steel beams in concrete boxes. These beams act as huge shock-absorbing springs. Frequency of the "spring" is carefully calculated to avoid possible resonance with the structure and equipment supported.

One of these springs is a pair of


Zone A
Concrete shell can settle without disturbing equipment it houses
Zone C
Mezzanine stands on columns with springs in their feet
Zone B
Inertia block carries generators

GENERATORS are to resist movement, all else should move harmlessly.

is buried in missile complex at Lowry AFB.

Beat the Bomb

beams that span 16 ft. The beams are made of welded high strength steel—90,000 psi ultimate—with the webs 4x⅜ in. and the flange plates 9¼x1 in. Static deflection from a 50,000-lb load is computed at 1 in. and frequency is calculated to be 3.13 cycles.

A diesel-powered generating plant must have a supply of fresh air. Fans provide 20,000 cfm for engine combustion and 115,000 cfm for ventilation. Engine exhaust escapes to the surface through blast valves; it is forced out with cooling air. New air is drawn into the powerhouse through similar blast valves.

Should a blast occur, sensing devices will close the blast valves, isolating the entire plant to make it a self-contained unit. When the shock wave passes, the blast valves reopen automatically. If the overpressure continues for more than a minute or two—a highly unlikely condition—the entire plant would shut down due to temperature rise in the powerhouse.

Other sensing devices keep radiation levels down to tolerable limits should surface air be contaminated. Some radioactivity is removed by passing the incoming air through filters similar to those used to catch flyash. Removing radioactive articles is the best way to keep air-borne radioactivity down.

One of the big uses of power in the generating plant is operation of the chilled water system for air conditioning and cooling the engine lube oil. To reduce the size of the power plant, ice banks have been installed. Thus, when the entire missile installation is operating at a peak effort, chilling effect comes from a combination of these ice banks and one of the water chillers. And when the entire installation is under normal load conditions, power is used to produce ice in the ice banks. There are three such banks; each holds 15 tons of ice.

Water supply for the installation comes from a pair of deep wells (one is a standby) drilled into the earth at the bottom of the power plant. Total normal usage is 125 gpm. The designers have provided a nominal amount of water storage, including a 10-day supply for survival in event of emergency.

Even the deep wells' pump and fittings have a shock mounting inasmuch as a blast might produce relative motion between the power plant floor and the ground below.

The 4-in. well discharge pipe is inserted in a 12-in. well casing. And the discharge pipe is supported by a 4 ft 10 in. dia steel base mounted on heavy steel springs.

The missile launching facilities were designed under direction of Brig. Gen. William E. Leonhard, Deputy Commander, Civil Engineering, for the Air Force Ballistic Missile Division in Los Angeles. Architect-engineer was a joint venture of DMJM, Rust Engineering Co., Leo A. Daly Co., Inc. and Mason & Hanger-Silas Mason Co., Inc. L. L. Snedden of Mason & Hanger supervised the design. Each firm supplied key design personnel.

Construction cost $70 million. It was handled by a joint venture of Morrison-Knudsen Co., Inc., Paul Hardeman, Inc., Johnson, Drake & Piper, Inc., Olson Construction Co.; and F. E. Young Construction Co.

ROBINSON
led the way to...

NEW CLAY PIPE

■ **Today's all-new Clay Pipe is the fastest-laying, longest-lasting, most leak-resistant Clay Pipe ever known. Robinson research helped create it, and Robinson's 15 strategic branches get it to you on time.**

NEW **LENGTH—Cuts installation time and costs, keeps jobs on schedule.**

NEW **STRENGTH—Extra density takes heavier loads, traffic vibration.**

NEW **JOINTS — factory-made Wedge-Lock®, Wedge-Lock® Type "O," Slip-Joint.**

NEW **GUARANTEE*—Now a full 100 years!**

**Write for your copy of the 100-year Clay Pipe guarantee certificate.*

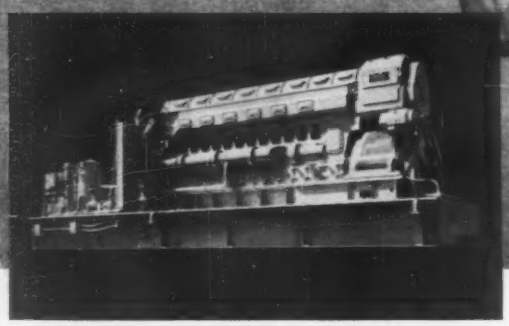
Wedge-Lock and Wedge-Lock Type "O" conform to ASTM Designation C425, Type I and Type III.

THE ROBINSON CLAY PRODUCT CO.
ESTABLISHED 1856
AKRON 9, OHIO

B-461-147

Akron, Ohio • Albany, N.Y. • Baltimore, Md. • Boston, Mass. Buffalo, N.Y. Caldwell Township, N.J. • Chicago, Ill. • East Hartford, Conn. • Indianapolis, Ind. New York, N.Y. • Philadelphia (Pottstown, Pa.) Rochester, N.Y. • Syracuse, N.Y. • Toronto, Ontario, Canada • Yonkers (Westchester County), N.Y.

NOW! FULL POWER IS 15 SECONDS FAST!



Solve peak-load and standby problems! F-M's exclusive O-P Diesel Generating Units provide *full* power in 15 short seconds . . . *from a cold start!* They need no spinning reserve. Use no power till you use them! The reason? Our exclusive O-P (Opposed-Piston) design. Two pistons in one cylinder function from a *single* combustion. This minimizes *vibration* . . . produces fine *balance, smooth* power to peak the generator—in just 15 seconds! F-M Opposed-Piston Diesel Generating Units are available with automatic or manual controls. Produce up to 2500 kw. They may be linked in multiple units for peaking, standby duty . . . or dead load pickup! You can't buy better—or more economically.

For full details or custom specifications, write today to: **Mr. S. K. Howard; Diesel Division; Fairbanks, Morse & Co.; Beloit, Wisconsin.**

FAIRBANKS MORSE

A MAJOR INDUSTRIAL COMPONENT OF

FAIRBANKS WHITNEY

International

High Tower for San Juan Bank

A 25-story reinforced concrete bank planned for construction this summer in San Juan will be Puerto Rico's tallest building. Bids for the $6-million Banco Popular project will be taken in the "early summer" and construction will follow as soon as possible, the architect says.

The reinforced concrete frame of the office tower is designed to withstand heavy earthquake and wind forces. At the top of the building, design wind loading will be 50 psf. Pairs of shear walls to resist these lateral forces are located at each end of the building and extend down to a heavy foundation mat carried on piles.

Piles vary from 35 to 40 ft in length; the mat thickness varies between 5 and 6 ft. Because calculated forces for wind load and earthquake action are so large, a large portion of the piles will be battered to resist horizontal forces passed down through the shear walls and columns to the foundations.

In the lower floors of the superstructure, load transmission is a problem.

The engineers have specified A432 steel for reinforcing in columns and shear walls below the second floor since forces become so large there. This steel, with a 60,000 psi yield point, keeps column size down between grade and second floor and allows the architect to neck-down the end shear walls at the bottom of the building. Reinforcing bars go up to 18S in size—2¼ in. dia—in the necked-down portion of these shear walls to satisfy ACI code requirements. The shear walls are hexagonal in cross section. They taper from 15 ft length at grade to 27 ft length at the second floor level. They vary from 3½-ft thickness at mid-length to 2 ft thickness at the ends.

Exterior walls—reinforced concrete 8 in. thick—provide part of the tower's stiffness along the length of the building. Two window units 4x5 ft occur in each bay of the wall. Windows were kept small to cut air-conditioning load and to reduce glare in the offices as well as to add stiffness to the building.

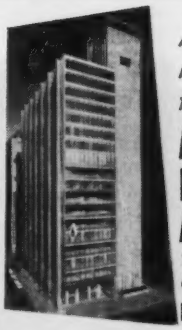
Concrete in the superstructure will be generally 3,000 psi, but small sections and columns will take 3,500 and 3,750-psi concrete. The shear walls will be 5,000-psi, cast-in-place concrete between grade and the second floor.

Banco Popular, the owner, will occupy wing sections at the base of the tower as well as two floors in the building.

In addition, the tower will contain 288,000 sq ft of rentable floor area.

A shopping center next to the tower will be built later as a separate project. The completed development will have parking space for 1,000 cars. There will also be a bank employees' auditorium seating 300 persons.

Chauncey W. Riley is the architect. Throop & Feiden is the structural engineer. Tizian Associates are the mechanical engineers. All are New York City firms.



A valuable reference work for engineers

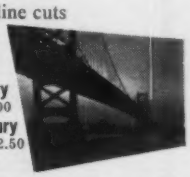
AMERICAN BUILDING ART

THE TWENTIETH CENTURY

By CARL W. CONDIT

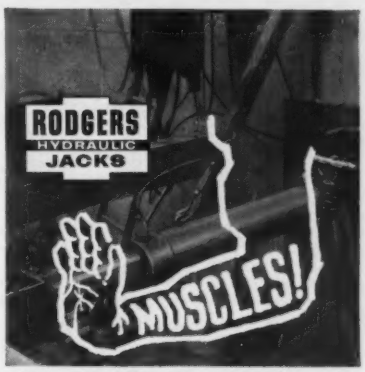
Here is a wealth of information for engineers, architects, professors, and students on the use and development of American building techniques in the last 60 years. Continuing his discussion begun in *American Building Art, The Nineteenth Century*, Professor Condit takes up steel frames, steel truss and girder bridges, steel arch bridges, suspension bridges, highway construction, hydroelectric construction, advances in concrete construction.
102 halftones; 38 line cuts

AMERICAN BUILDING ART
The Twentieth Century $15.00
The Nineteenth Century $12.50



At all bookstores

OXFORD UNIVERSITY PRESS, N. Y. 16



for Jacking, Lifting, Pressing, Pulling...

To push the largest concrete tunnel shields or sewer pipe into place, to raise bridges, move buildings, to set reinforced concrete decking, to prestress concrete forms... for any jacking, lifting, pressing or pulling job requiring high-pressure hydraulic equipment, you can depend upon RODGERS Jacks. Immediate delivery, sizes from 50 to 600 tons. Outline your requirements to us and let our engineers suggest the equipment best suited to your needs. J-101D

RODGERS HYDRAULIC, INC.

Pioneer in high-pressure Hydraulics, since 1932
7401 Walker St. • Minneapolis 26, Minnesota

Waterplug and Thoroseal

Far Exceed Specifications

Even Eight Years Later!

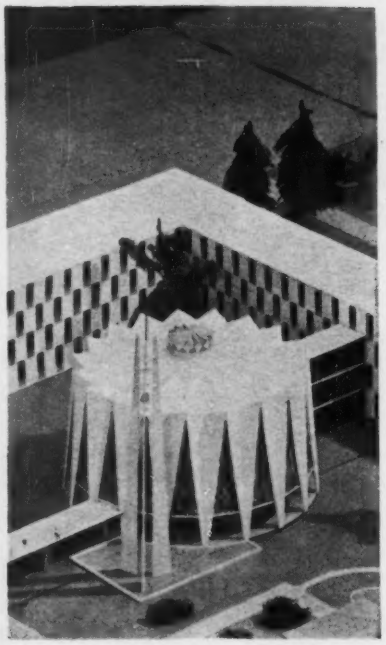
Eight years ago this 10,000,000 gallon underground reservoir was wasting some 1,750,000 gallons a day through leaks, cracks, and actual consumption by huge invading root formations. On test, water level dropped 3 feet 2 inches during a 24-hour period.

Waterproofing specifications: maximum drop of 1" in 24 hours. Process: After draining and cleaning the reservoir, Waterplug hydraulic cement was forced into cracks. All running leaks stopped instantly. Next: A sealer coat of waterproof cement-base Thoroseal was brushed onto walls, and out onto the floor for 3'. A second coat of Thoroseal was applied 24 hours later.

Only 3/8" drop in water level after 24 hours, new test showed! (In the arched 2,000,000 cu. ft. structure, evaporation accounts for around that much.) Regular tests since show the same high performance continues today, way above specifications! Estimated savings to date: nearly $200,000, and still going on.

• Let The Thoro System help you save on *your* waterproofing problems—above grade or below, in new construction or renovation. Specify masonry specialties with top performance records since 1912. Write for complete Specifications Guide: to all these Thoro products.

STANDARD DRY WALL PRODUCTS, INC.
DEPT. E-2, NEW EAGLE, PENNSYLVANIA



Radial Steel Bents Frame Round Roof for a Chapel

A circular chapel with a steel-framed scalloped roof and tapered precast-concrete wall panels is under construction in Chatham, Ontario. It is part of a $1.4-million project comprising the chapel and a convent for the Ursuline Sisters.

Inverted L sections, set around the perimeter of the chapel, will form the 65-ft-high steel columns and the girders of the 116-ft-dia roof. They will frame into a central lantern ring of steel and reinforced concrete. A four-legged falsework tower will support the steel framing during erection.

Spanning between the 20 radial roof girders, bent steel purlins will shape the scalloped roof surface. Wood decking, 3 in. thick, will cover the roof.

The welded steel frames will have tapered legs with ⅝-in. webs varying from 10-in. depth at column base and lantern ring to 30-in. depth at the knee. The flange plates will measure 12 x ¾ in.

Tapered precast-concrete wall panels will be anchored to the steel columns by reinforced concrete cast around the columns at the site.

Triangular glass panels between the precast wall panels will complete the wall enclosure.

Structural engineer is Todgham & Case of Chatham, Ont., with Edgar A. Cross & Associates of Toronto as associates. Architect is J. W. Storey of Chatham. General contractor is Eastern Construction Co., Ltd., of Walkerville, Ont.

(Advertisement)

Progress Report on STEEL CONSTRUCTION

JUNE, 1961

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY

Two New 'Scrapers for the San Francisco Skyline

That's the International Building in the foreground, shown just after topping-out by a Bethlehem erection crew. The finished building will be a beauty, twenty-two stories high. And note how the floors cantilever out from the column perimeter, providing an extra column-free sixteen feet on all four sides. The job required 4,074 tons of structural steel, fabricated by Bethlehem, and connected in the field with 113,500 A-325 bolts, and 9,500 extra-high-strength bolts.

Owner: Natomas Company; *architect:* Anshen & Allen; *structural engineer:* John J. Gould & H. J. Degenkolb—Robert D. Dewell; *general contractor:* Dinwiddie Construction Co.

In the background, high on Nob Hill, stands the 29-story addition to the Fairmont Hotel. It, too, was fabricated and erected by Bethlehem, and was topped out late in 1960. Its 22-story tower springs from a massive, 7-story steel-framed base providing a three-level parking garage, a convention and exhibit hall, dancing pavilion, and delightful gardens. The structure contains 3,089 tons of structural steel, field-joined with some 92,000 A-325 bolts.

Owner: Fairmont Hotel Company; *architect:* Mario Gaidano; *structural engineer:* H. J. Brunnier; *general contractor:* Haas and Haynie Corporation.

Unique Steel Frames for Washington, D.C. Stadium

BETHLEHEM STEEL

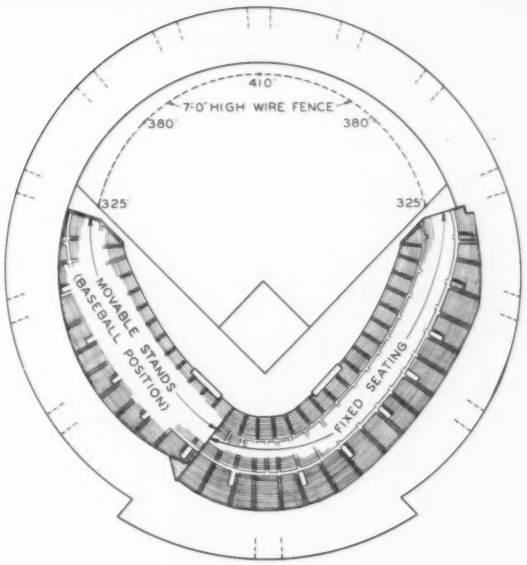
WASHINGTON, D.C.—A total of sixty-six giant steel frames will support the roof and upper-deck seating for the new District of Columbia Stadium.

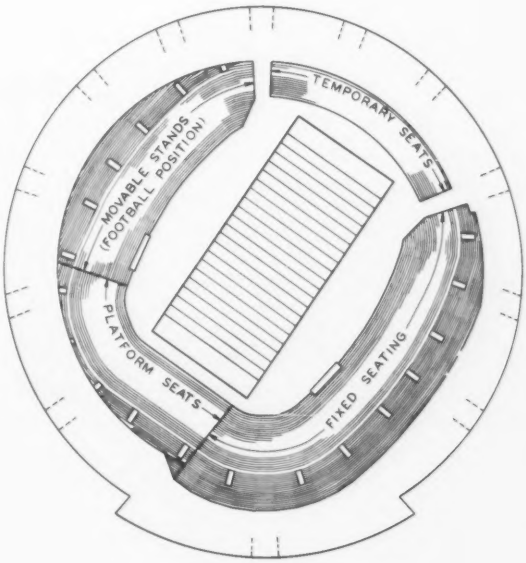
The upper cantilever arm's 70-ft reach will support roofing to shelter a major portion of the seating. The lower cantilever, varying up to just over 60 ft in length, soars out over lower-level seating, avoiding any need for obstructing columns. Every seat in the "house" has a clear view of the playing field; capacity is 43,500 for baseball, 50,000 for football.

The nature of the job required that Bethlehem use erection equipment with unusually long reach. What you see here is a 35-ton-capacity stiffleg derrick (44-ft mast and 90-ft boom plus 15-ft jib) mounted on an 85-ft tower traveler movable over temporary tracks. An 80-ton-capacity crawler helps out. It has a 140-ft boom with 30-ft jib.

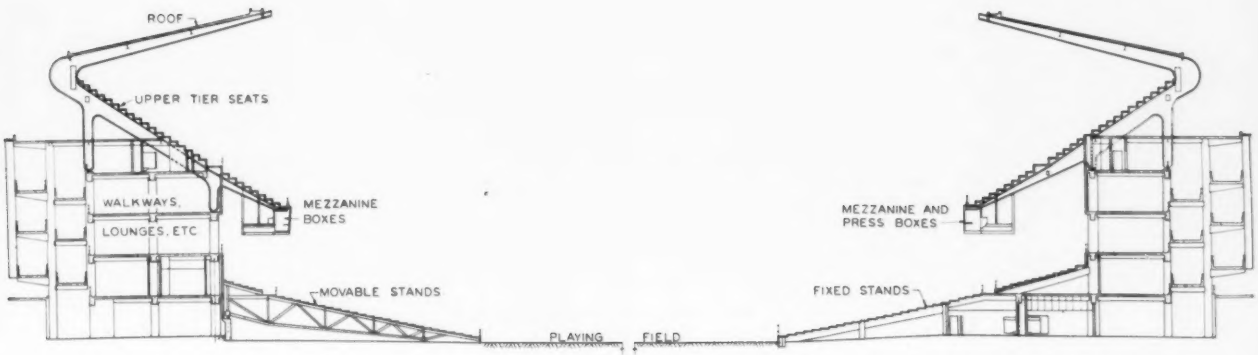
All sixty-six frames are of box design, combining great strength with neat appearance. They were shop-welded, using Bethlehem plates meeting ASTM A373, ranging in thickness from ⅝ in. to 1¾ in. The lower frame arm is readily identified by the seat brackets welded to its upper face. At the job site the assemblies were placed, in most places without falsework, temporarily fitted up, and later finish-welded in position. Located at about 30-ft intervals, the frames are supported laterally by welded box struts, welded into position, and wide-flange roof beams connected with high-strength structural bolts.

Owner: District of Columbia Armory Board; *architects and engineers:* Dahl-Erwin-Osborn. McCloskey & Co., Builders.

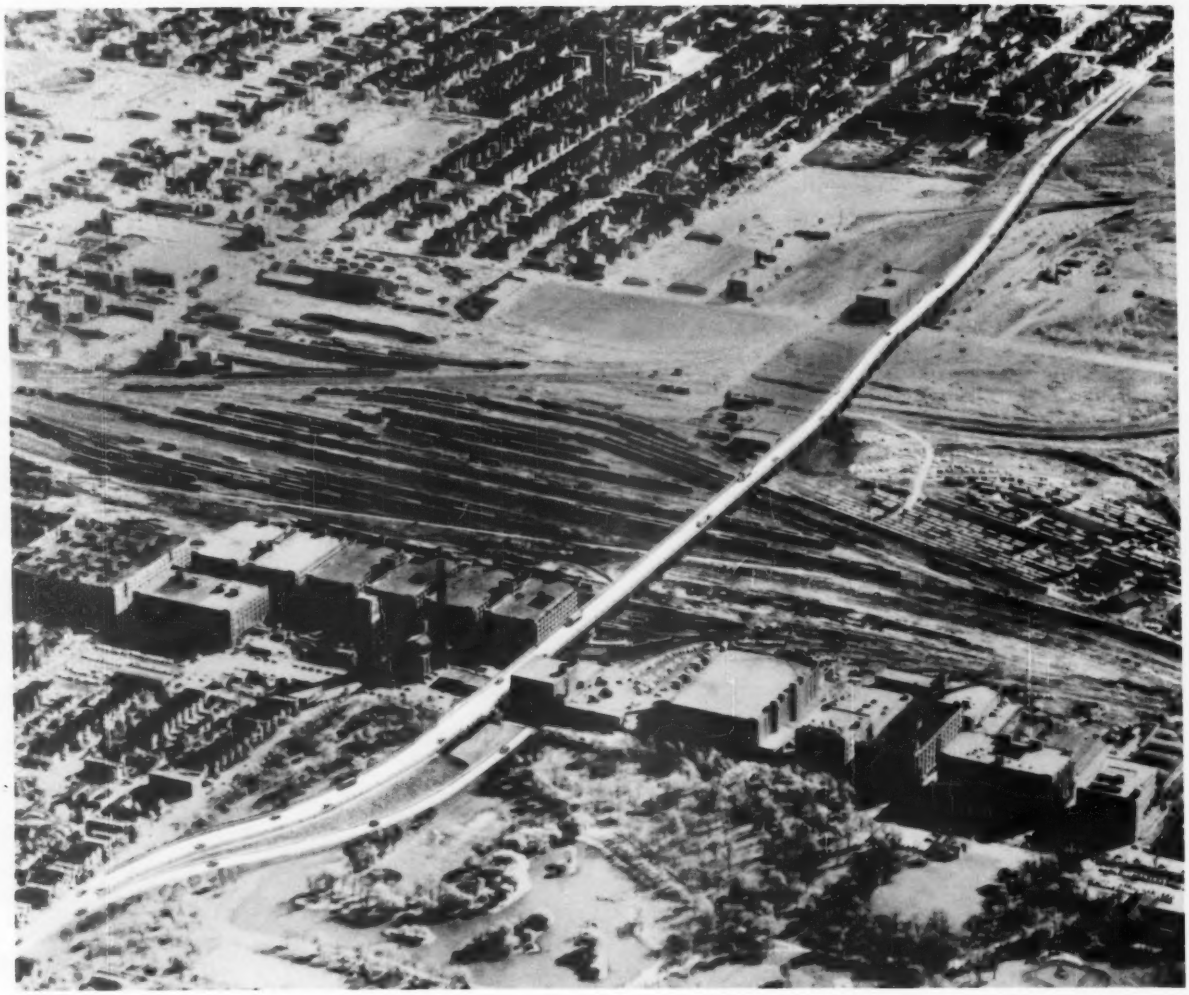




Sketches show how the movable, 340-ft-long seating section works. This arrangement puts 80 per cent of the seats along the foul lines for baseball and 50 per cent along the sidelines for football.



Typical section clarifies the stadium's novel design. Radius is 348½ ft to center of the outside column line. Maximum height from the playing surface to roofline is nearly 100 ft. Note the press box and mezzanine seating, suspended under the upper tier seats, and the movable stands on tapering, truss-like supports.



Artist's rendering of bridge superimposed on aerial photograph. From bottom, the new road crosses a corner of McKinley Park on fill, proceeds as a viaduct south over Pershing Road, through the Central Manufacturing District, over the railroad yards with minimum clearance of 22 ft, over 43rd Street and industrial spur lines, and back to grade at 47th Street.

We've Been Working Over the Railroad

CHICAGO—As every local motorist knows, you can't go very far in any direction without encountering a railroad right-of-way. Providing structures to move traffic over or under these formidable obstacles has always been a major concern of the City's Department of Public Works.

The last remaining obstructed portion of Damen Avenue, the stretch from West 37th Street to West 47th Street, is slated to be opened in November as a main traffic artery. This will mark completion of what is known as the South Damen Avenue Improvement, 6,700 ft of road construction, including a 4,750-ft viaduct.

The viaduct is where Bethlehem came in. As superstructure contractor, we began erecting steel for the multi-span elevated highway early in the year, and since that time have literally been working "over the railroad." Total structural steel requirement is roughly 9,000 tons, including both simple-beam spans and a large number of long and hefty continuous plate-girder spans.

Handling a great many pieces of steel within the busy Chicago Junction Railway Yards required careful scheduling of work, as well as the cooly efficient erection procedures you would expect of a thoroughly experienced organization. Equipment used on the job includes an 80-ton-capacity crawler, a 75-ton-capacity locomotive crane, and a traveler set up on the roadway.

Engineering design, field engineering, and construction work is handled by the Division of Bridges and Viaducts of the Bureau of Engineering, Department of Public Works. *Consulting engineer:* A. J. Boynton and Company; *contractor for viaduct substructures:* James P. McHugh Construction Company; *general contractor for approaches:* J. M. Corbett Company.

BETHLEHEM STEEL

The Boomingest Boulevard

LOS ANGELES—This is a bird's-eye view of Wilshire Boulevard as of January, 1961. The date is important, because few things go out of date quite so fast as photographs, facts, and figures of the boomingest boulevard in the land.

To give you a rough idea, at one point in 1960 reliable sources reported thirty-eight major buildings just completed, under construction, or planned—totaling some 8,000,000 sq ft of floor space. Informed observers estimate that office space on Wilshire will add up to 30,000,000 sq ft by 1970.

With land costs mounting steadily, and premium boulevard frontage going at $1,500 a foot, it's natural that the building trend has been skyward, limited only by the local building code.

Naturally, most of the behemoths of the boulevard have steel frames, many of which have been fabricated and erected by Bethlehem. In fact, since 1948 we have put up the steelwork for seventeen buildings, aggregating 195 floors of office space. And a number of elegant and noteworthy newcomers are now literally "in the works."

A few of the well-known Wilshire Boulevard buildings fabricated and erected by Bethlehem are as follows:

Travelers Insurance Company Building: 22 floors

IBM Building: 12 floors

Wilshire-Flower Building: 22 stories

3325 Wilshire (Catalina Tishman) Building: 12 floors

3440 Wilshire (Tishman): 3 buildings of 12 floors

Texaco, Inc., Building: 13 floors

Gershon-Scott Building: 13 floors

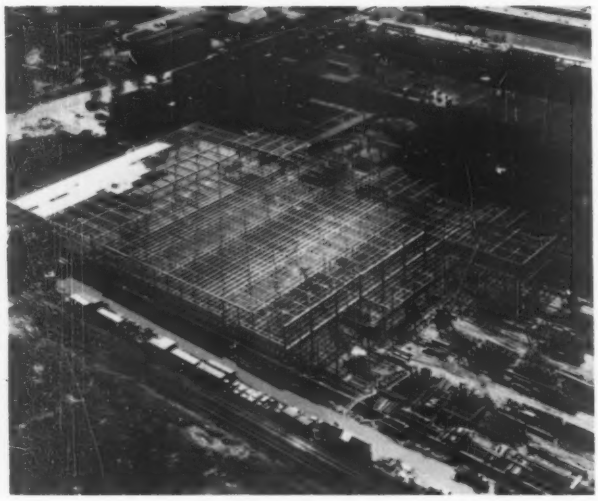
Wilshire-Grand: 9 floors, with 13-floor addition

Prudential Insurance Company Building: 12 floors

Tidewater Realty Company Building: 9 floors

Western & Southern Life Insurance Co. Building: 7 floors

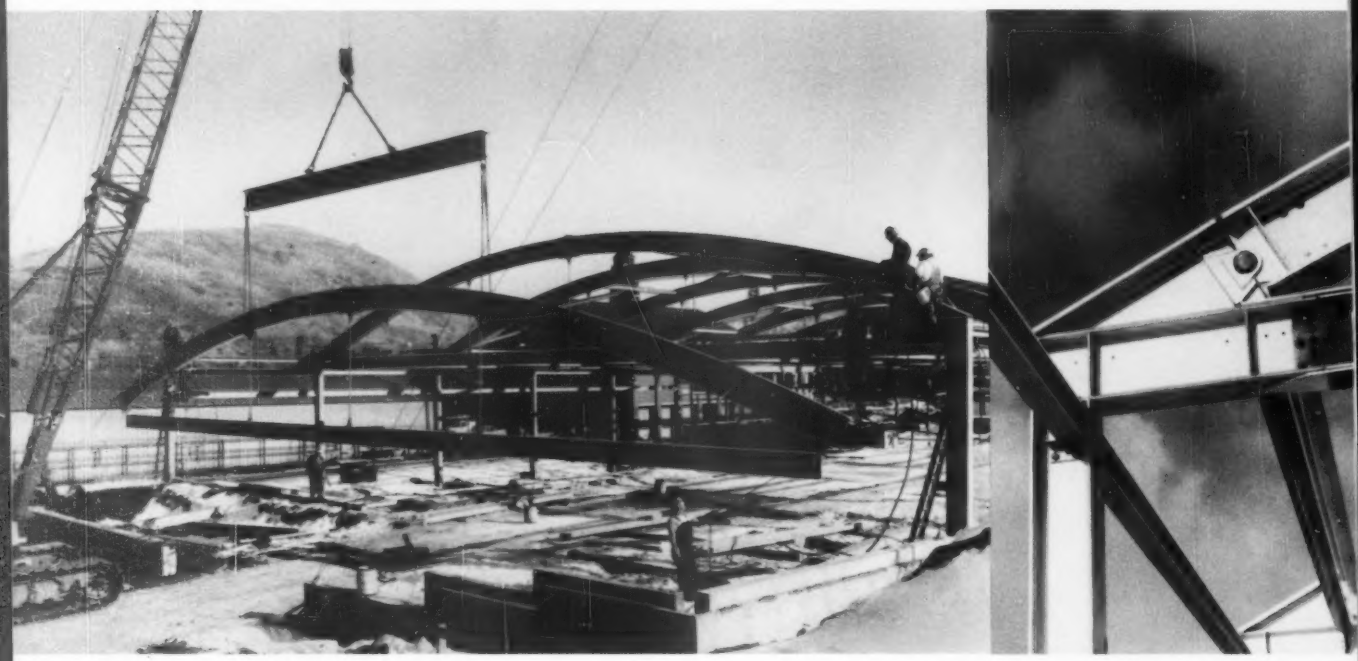
Linde Medical Plaza (in progress): 12 floors



Chevy Expands in Baltimore

BALTIMORE—Slanting rays of the sun highlight the steelwork for a portion of a new addition nearly doubling the size of the already huge Chevrolet-Fisher Body plant. The job required a high-strength-bolted framework of approximately 7,100 tons of structural steel, fabricated and erected by Bethlehem.

Owner: Chevrolet Motor Division, General Motors Corporation; *engineer:* George H. Miehls—Albert Kahn Associated Architects and Engineers, consultants; *general contractor:* Consolidated Engineering Company, Inc.



A pin connector, high-strength bolts, and welding were used in the arch-to-column connections.

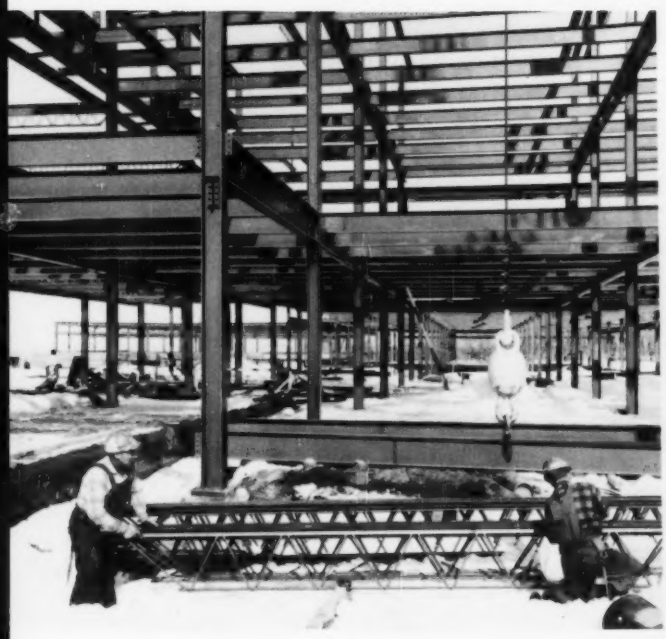
Tied Arches to Span 97 Ft

JOHNSTOWN, PA.—Up goes one of seven two-hinged tied arches for Pennsylvania Electric Company's new storage and line building. Thanks to their 97-ft span, there are no obstructing columns within the building's 300-ft-long floor area. The arches (24 WF 94) rise 13 ft above the chords (18 WF 55 up to 18 WF 85), and will be exposed above the roof of the completed building.

This structure is but one of a complex of facilities for the utility's new system headquarters and divisional service center in Johnstown. All the buildings are framed with structural steel, fabricated and erected by Bethlehem. Largest of all is the headquarters building, 220 ft long and four stories high, plus a two-story wing. It is planned as a model of efficiency and comfort, with electricity supplying the power for a combination heating, cooling and air-cleaning system, and snow melting.

Owner: Pennsylvania Electric Company; *architect:* Lacy, Atherton and Davis; *structural engineer:* A. W. Lookup Co.; *general contractor:* Sordoni Construction Co.

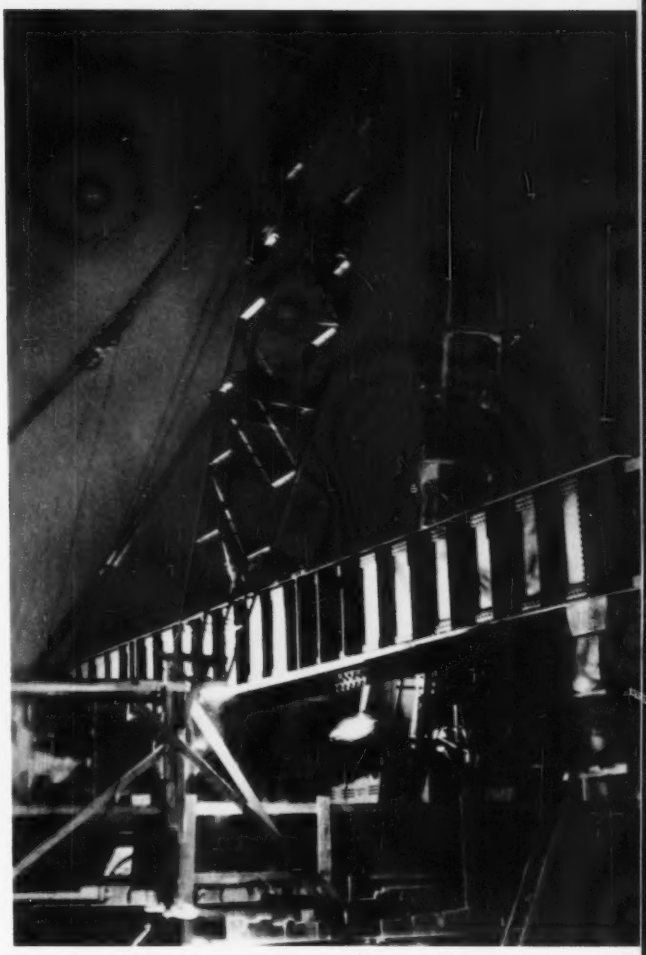
BETHLEHEM STEEL



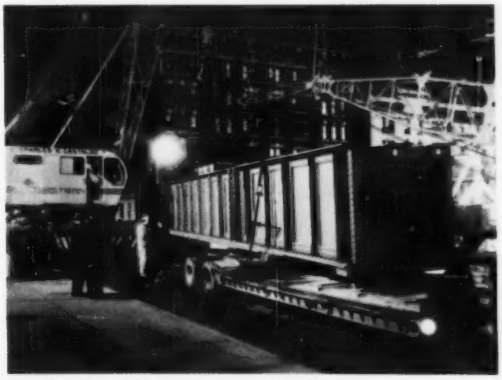
Steel for Space Study

VALLEY FORGE, PA.—Nearly two hundred years ago a rugged winter earned this community an indelible spot in the history of our country. The weather was equally severe last winter. But snow on the ground and sub-freezing air didn't prevent Bethlehem ironworkers from speeding ahead with steel framing for General Electric Company's $30 million Space Technology Center—research and development laboratories for the Missile and Space Vehicle Department. The 800,000-sq-ft facility is 17 miles west of Philadelphia, just off the Pennsylvania Turnpike on a 130-acre site.

Credits for various phases of the work: United Engineers and Constructors, Inc. (engineering and architecture); Vincent G. Kling (architecture); Jackson & Moreland, Inc. (engineering).



Big Box Girder for Bus Station



NEW YORK CITY—Ever see a building component as massive as this one? It's 150 ft long, and weighs a solid 205 tons. It is one of the four box girders for the George Washington Bridge Bus Station in New York City. They span Fort Washington Avenue, supporting the ramps between the station and the bridge.

The bus station extends for two city blocks on three levels, and requires 5,770 tons of structural steel, all fabricated at Bethlehem's Pottstown Works, and being erected by Bethlehem crews. Trans-bridge buses will be using the huge new facility beginning in summer of 1962.

Owner: The Port of New York Authority; *designed by:* Port Authority engineers. These box girders are part of the structure which supports the unique roof over the Bus Station, designed by Dr. Pier Luigi Nervi.

Late News Flashes

Hartford, Conn. -- In February, Bethlehem ironworkers began erecting the steelwork for 100 Constitution Plaza, a handsome, 18-story office building for the Constitution Plaza urban renewal project. Nearby, work is now under way on the 20-story Connecticut Bank & Trust Company building. This is the tallest structure thus far designed to take advantage of the dramatic economies possible with the new ASTM A-36 structural steel.

San Francisco -- Contracts have been awarded for the United States Court House and Federal Office Building, which will boast more floor space than any other office building west of Chicago. Twenty stories high, it's to be sheathed with a combination of limestone, granite, and metal curtain walls. Bethlehem is supplying over 18,000 tons of structural steel for the frame.

Beaver Falls, Pa. -- Work has begun on the largest bridge project currently under way by the Pennsylvania Department of Highways. It's the Beaver Falls Bridge, a 3-span continuous through-truss structure extending 840 ft over the Beaver River. It replaces a nearby Whipple truss bridge, vintage 1884.

New York City -- Bethlehem ironworkers recently began erecting the 30-story framework for the Bankers Trust Building, on the west side of Park Avenue between 48th and 49th streets. The trickiest phase of putting up approximately 5,800 tons of steel is underground, where steel columns and beams have to be placed in between and over two levels of railroad tracks. The bank, which will occupy 60 per cent of the building, is leasing from the owners, Rose Associates.

(Lack of space makes it impossible to list the professional firms responsible for the above projects. Names will be furnished on request.)

DO YOU HAVE THESE USEFUL BOOKLETS?

Steel Piling
Catalog 433-A. Dimensions, properties, and specifications for steel sheet piling.

Catalog 223. Contains useful data and specifications on steel H-piles.

High-Strength Structural Bolts
Booklet 563-A. Uses of high-strength bolts in connecting structural steel. Includes latest revisions of specs.

Structural Shapes
Catalog S-58. Information and tables on structural steel shapes for use by architects, engineers, and designers.

Wire Rope
Catalog 493. Covers every wire rope application used in construction. Includes complete section on fittings.

Steel Pipe
Booklet 393-B. Useful information on continuous butt-weld and electric resistance-weld pipe.

Reinforcing Bars
Booklet 527-B. Contains joint details and recommended procedures for welding reinforcing bars. Includes tables and drawings.
Booklet 583. Complete description of new-billet reinforcing bars meeting ASTM specs. Contains examples of cost-saving designs with high-strength steels.

Open-Web Joists
Catalog 553. Describes "S" Series (Shortspan) and "L" Series (Longspan) open-web steel joists. Includes new Shortspan joist with cold-formed chords.

Bridge Rail
Booklet 559. Bethlehem Perfect Vision Bridge Rail is described with all specifications and testing.

ASTM Structural Grades
Booklet 569. ASTM specs for six grades of structural steel which meet 98% of all usual requirements.

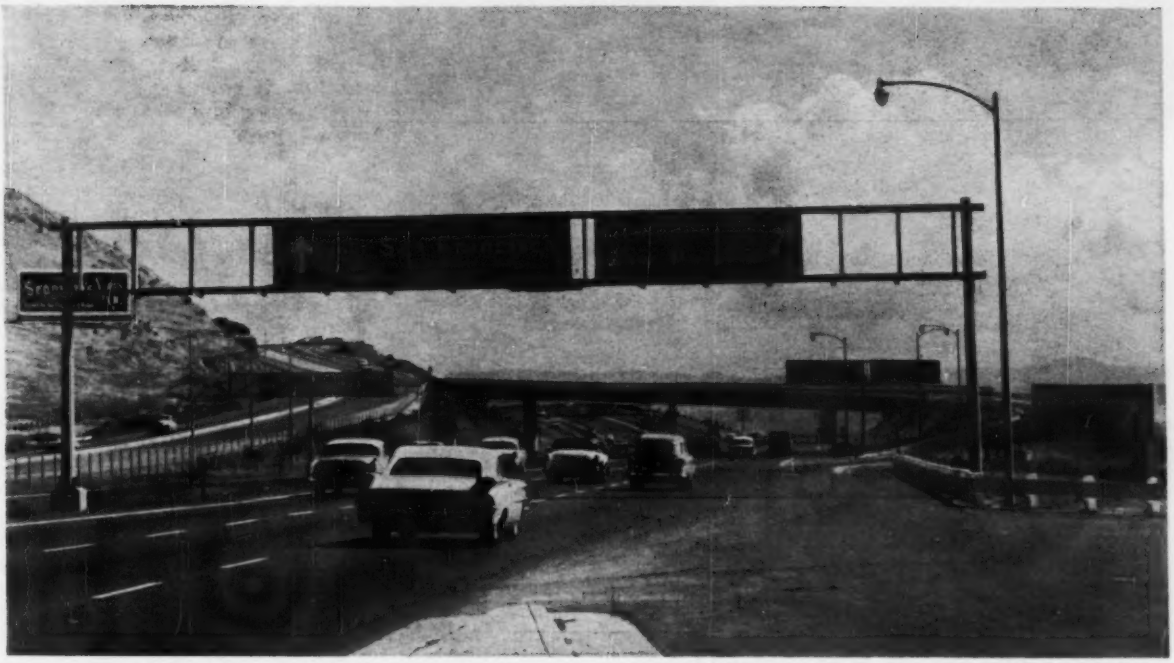
Steel
for Strength
. . . Economy
. . . Versatility

For your free copies of any of these publications, please write to Publications Department, Bethlehem Steel Company, Bethlehem, Pa.

Export Sales: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL



Expressway has plenty of "hardware"—signs, guard rails, bridge rails, fences, light standards.

How To Design Highway Hardware

The United States Steel Corp. has published the first of two "Technical Notebooks on Highway Hardware." It covers the design of steel signs and sign supports.

The second volume, which will be published this summer, will deal with bridge railings, light standards, guard rails and right-of-way fencing.

The loose-leaf style manuals include criteria, specifications and detailed designs for various grades of steel. Volume I stresses use of the newer high-strength, low-alloy steels that have increased resistance to corrosion.

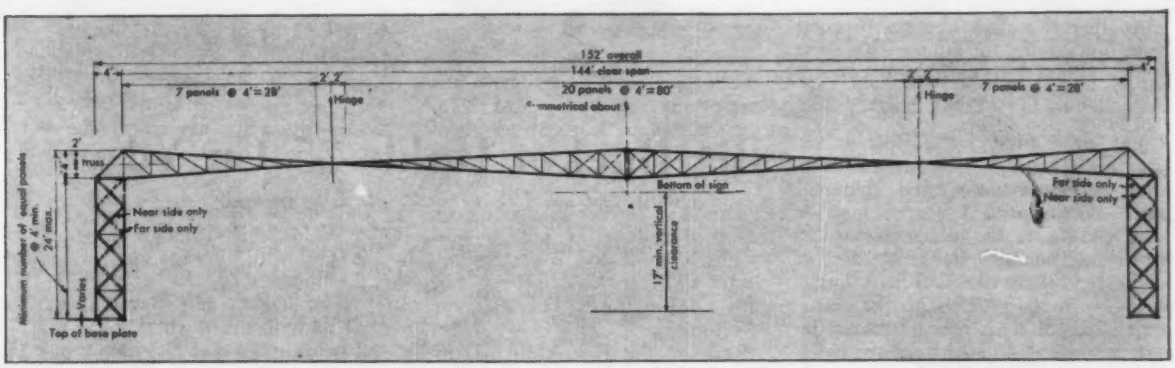
Engineers can use the information to design the larger signs and more frequent overhead installations required on expressways, as well as for more conventional signs.

Volume I has five sections and an Appendix. The first is general in nature. The second will contain the "Specifications for Highway Signs" now in preparation by a joint AASHO-ARBA committee.

Section 3 discusses and illustrates the steps necessary to design several sign support structures, including overhead and roadside applications. The fourth section covers the design of sign faces for small, simple sheet signs and the larger directional type sign panels. Section 5 contains samples of current design practices for steel sign supports used by different highway organizations. The Appendix has examples of designs from the notebook and the equations used in establishing the designs.

The designer will have a choice of several alternate designs in different steels in order to judge efficiency, economy and aesthetics with minimum effort.

(*Please turn the page*)



CANTILEVERED and suspended truss structure is one of the sign support designs in U. S. Steel's new manual.

SHORT SUSPENDED SPAN is less susceptible to vibration than other designs of same over-all length, designers say.

Specifications used in designing the sign structures include wind pressures of 30, 40 and 50 lb per sq ft, maximum vertical deflections equal to $d^2/400$ (d=sign depth) and ice loadings.

The sign support structures detailed in the notebook are said to comply in all respects with the November 1960 draft of the AASHO specifications. Alternate designs are for steels having basic design stresses in tension of 20,000 and 27,000 psi. These stresses correspond to A36 and A242 steels.

Volume I describes two types of supports for overhead signs—bridges spanning the roadway and cantilever structures. A cantilevered mounting in which signs extend from both sides of a single column is referred to as a "butterfly."

Wilbur Smith and Associates, consulting engineers of New Haven, Conn., compiled and developed designs for three types of sign bridges. All are trussed structures.

One is a simply supported box truss of uniform section. Depth of the truss increases for longer spans to keep vertical deflections within allowable limits.

Another is a rigid frame with good deflection control for intermediate span ranges. Pinned column base connections simplify foundation design for this sign bridge.

The third bridge is a tapered box truss hung between two trussed cantilevers mounted on trussed columns. Since the suspended center span is relatively short, the designers say, it has a high natural frequency and is less susceptible to vibration than simple or rigid frame bridges of the same overall length. This permits control of vertical deflection in longer spans without increasing truss depth.

The manual makes design of each type of bridge easy. Design of the simple span bridge requires simple substitutions in a few formulas and slide rule computations that take a few minutes. The designer can select truss members for the other two bridge types from detailed tabulations. All three can be designed with various types of members and in various steels.

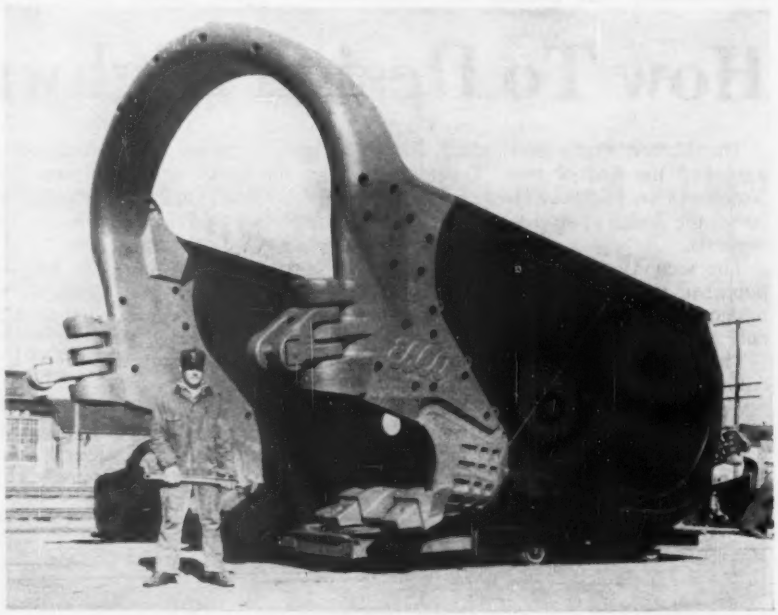
The manual contains designs for cantilevered sign supports for 30, 40 and 50 psf wind pressures and for both A36 and A242 steels. Pipe is used for the cantilevered support members because of its good resistance to torsion. The design has a trussed cantilever arm. Tables give sizes of structural members for use with various widths and depths of signs.

The book contains a step-by-step procedure for design of supports for butterfly signs.

Ground-mounted signs (such as regulatory and warning signs) are small enough to be supported by one or two posts. The manual gives tabulated information for post selection.

The book also includes information on the design of signs. It recommends sheet steel for sign faces up to 6 ft wide. Wider signs require stiffening of face panels to control vibration and deflection.

The manual gives design data on a system of built-up face panels for large directional signs.



Big Bucket Holds 35 Cu Yd

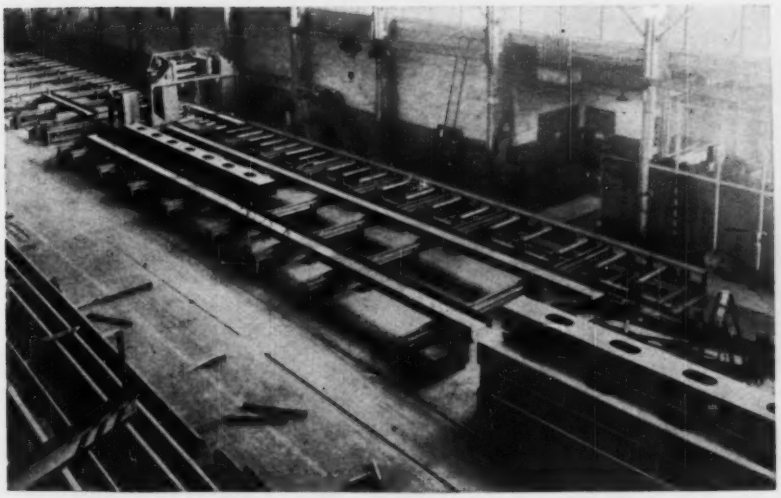
This drag bucket can gobble up 35 cu yd of material at a single bite. It weighs 35 tons and is cast by an all-electric shovel with a 220-ft-boom rigged with a 2¾-in. rope. The drag line is 3⅛-in. rope.

Built by the Esco Corp., Danville, Ill., the bucket is 13 ft long, 10 ft wide and has a rated capacity of 5½ tons.

Welded high-strength steel in thicknesses up to 5 in. was used to fabricate the bucket.

The dragline unit is working an open pit mine in Brazil where it can dig 170 ft below grade and cast onto a pile 110 ft high, 425 ft away.

Research and Development



Automation is aim in modernization of R. C. Mahon structural steel plant.

Fabricator Moves to Cut His Costs

In line with the trend to more efficient steel shop fabrication, R. C. Mahon Co. is replacing all production equipment in its 76-acre, ¾-mile-long structural steel plant in Detroit with more automatic equipment. The modernization program is expected to be completed in 1966.

Most important step in the program to date is the installation of a drilling machine with electronic, numerical positioning controls. Cost savings of about 85% in drilling holes were achieved in its initial application on bridge members of high-strength steel. The savings are attributed to elimination of layout operations, use of high-speed drilling and feeding of structural members on conveyors through the tape-controlled machine.

The company also has installed a conveyorized paint system, 15 ft wide and 400 ft long. It incorporates a paint spray booth that is claimed to be the largest in the industry. The conveyor moves at 5 ft per min has a capacity of ¾-ton per lin ft, so that the equipment has a theoretical capacity of more than 1,500 tons per eight-hour shift. The new system has cut painting costs in half.

The modernization program, on which $600,000 has been spent in the last two years, calls, in addition, for installation of high-speed automatic submerged-arc welding equipment. The larger tandem units of this type operate up to five times faster than manual units.

W. F. Sheetz, company president says, "The objective of our modernization program is to fabricate steel structures in the shortest possible time and at the lowest possible cost. We are meeting this objective through greater integration of our plant operations with modern metalworking methods combined with the latest materials handling and live storage techniques."

Synthetic Rubber Used In Road Repair Tests

Massachusetts, one of the states that pioneered the testing of natural rubber in asphalt road construction, is now trying a synthetic rubber in road maintenance and repair.

The material, called Naugapol 3112, was developed by U. S. Rubber Co. in conjunction with engineers of the Massachusetts Department of Public Works. It's a polymer, produced in small dry granules, that increase the viscosity and elasticity of asphalt when quantities as little as 3% by weight have been added.

So far, the tests have been limited to resurfacing some 30 miles of old, high-crown roads that had been leveled. While the rigors of a single winter are an inadequate test for any road material, the results have been so encouraging that DPW has recently let five new contracts for similar work.

The principal advantages claimed for the new material are shorter down time for roads and a reduction in the amount of materials used. For simple resurfacing a ⅜ in. coating of hot mix is applied. For complete resurfacing ½ to ¾ in. thick coat is used.

Don't Gamble

...you KNOW

CLOW CAST IRON PIPE

will last over 100 years!

Don't take a chance that breakage, leakage, deterioration and all the many other problems substitute pipe can bring will come back to haunt you. Cast iron pipe is the only real economy, the only truly low-cost pipe.

Why gamble when you KNOW that CLOW cast iron pipe will serve for over a century...is the *only* time-proven material?

Call on CLOW whatever your waterworks requirement. Our facilities, experience and manufacturing skill are at your service.

JAMES B. CLOW & SONS, Inc.
201-299 North Talman Avenue
Chicago 80, Illinois

Subsidiaries:
EDDY VALVE CO. • Waterford, N.Y.
IOWA VALVE CO. • Oskaloosa, Iowa

CLOW CAST IRON PIPE

EUCLID
all-wheel drive .

. . pays off in all-job versatility!

For high productive capacity and all around work-ability Euclid "Twins" are way ahead of other scrapers of comparable size. No matter what your scraper requirements may be—"mountain goat" climbing ability, pushing through high rolling resistance sand and heavy going, or working in good dirt—all-wheel drive "Eucs" get more work done on every job.

Both the TS-14 and TS-24 have proved outstanding performers and big producers on a wide range of work from big yardage projects to smaller jobs. With separate Torqmatic Drives and power trains for each axle, these "Eucs" work on grades and under adverse job conditions that stall other scrapers. Each is a one-man earthmoving spread that can work without a pusher tractor . . . each has plenty of power and traction to pick up a heaped load in a hurry . . . pull out of the pit fast . . . and really highball on the haul to the fill and return.

If you want 14 or 24 yd. scrapers (20 and 32 yds. heaped) that can work more days per year . . . that can handle more kinds of work and give you bigger production . . . ask your dealer for the facts and figures that show why all-wheel drive Euclid "Twins" give you a better return on your investment.

EUCLID **Division of General Motors, Cleveland 17, Ohio**

Plants at Cleveland and Hudson, Ohio and Lanarkshire, Scotland

TS-24 *563 total h.p. . . . capacity of 24 yds. struck, 32 yds. heaped . . . 27.00 x 33.5 tires with 33.5 x 33 optional.*

TS-14 *296 total h.p. . . . struck capacity of 14 yds. . . . 4-speed Torqmatic Drives with converter lock-up.*

GM GENERAL MOTORS EUCLID

EUCLID

FOR MOVING EARTH, ROCK, COAL AND ORE

This mark tells you a product is made of modern, dependable Steel.

Now Available...

USS QUENCHED AND TEMPERED STRUCTURAL SHAPES

in such grades as "T-1", "T-1" type A, 9% Nickel and HY-80 Constructional Alloy and Armor Steels

Announcing another industry "first" for United States Steel—USS Quenched and Tempered Alloy and Armor Steel Structural Shapes are now commercially available for the first time anywhere, in the types and sizes shown in the accompanying tables. The more commonly used sizes of American Standard Beams, Channels, Equal Angles and Unequal Angles will be produced in these USS Steels: "T-1", "T-1" type A, 9% Nickel, HY-80 and certain other alloy grades that provide desirable mechanical properties after quenching and tempering. Later, other sizes and shapes will be added according to demand.

These quenched and tempered alloy and armor steel structural shapes (see table below) can simplify design and result in substantial weight savings, increased structural strength and reduced shipping and handling costs. For a free folder about any of these steels or their structural shapes, contact your local USS representative or write to United States Steel, Room 6311, 525 William Penn Place, Pittsburgh 30, Pa. USS and "T-1" are registered trademarks

United States Steel Corporation • Columbia-Geneva Steel Division • Tennessee Coal & Iron Division • United States Steel Supply Division • United States Steel Export Company

Availability Quenched and Tempered standard structural shapes are available in the following shapes and sizes:

I	Beams: 6" to 12" inclusive	American Standard Sections and Foot Weights*
[	Channels: 6" to 15" inclusive	American Standard Sections and Foot Weights*
L	Equal Angles: 3" to 8" inclusive	Standard Sections*
L	Unequal Angles: 3½" x 3" to 8" x 6" inclusive Maximum Length 40' for all sections	Standard Sections*

*See our booklet, "USS Shapes & Plates," ADUCO-27001

Mechanical Properties of Quenched and Tempered Alloy and Armor Steel Structural Shapes

	Yield Strength, psi	Tensile Strength, psi	Elong. in 2", % min.	Reduction of Area, % min.	Longitudinal Charpy Impact (when specified)	
					Keyhole	V-notch
"T-1" Steel 2½" and Under	100,000 (min.)	115,000/140,000	18	55①	15 ft.-lbs. @ −50F	30 ft.-lbs. @ +10F
"T-1" type A 1" and Under	100,000 (min.)	115,000/140,000	18②	45④	15 ft.-lbs. @ −50F	—
Grade A 9% Nickel	60,000 min.	90,000 min.	22% min.	—	15 ft.-lbs. @ −320F	20 ft.-lbs. @ −320F
Grade B 9% Nickel	65,000 min.	95,000 min.	20% min.			
HY-80 ¼"-2" Incl.	80,000/100,000③	—	19④	—	—	70 ft.-lbs. @ −120F

①¼" and under—45% min.
②½" and over, yield strength range is 80/95,000 psi
③¾" to 1" inclusive, elongation 16% min.
④1½" to 2" inclusive, elongation 20% min.
⑤¾" to 1" inclusive, 55% min.

USS United States Steel

A Square Joins the Lamp Line

General Electric Co. will produce a thin, square fluorescent lamp. It will be marketed through GE distributors at $6.95, probably this fall when fixture manufacturers make fixtures for it available.

First production models, in cool white, will emit equal amounts of light from front and back. A second lamp will have a reflector back to direct most of the light from the face. Delux whites and lamps with colored back plates are also scheduled for production.

The basic lamp is 11⅝ in. square and 1½ in. deep. The total arc path compressed in the square is 5 ft long. Glass waffle squares, 1¾ in., diffuse light and give structural strength to the face. Bi-pin terminals, behind the outer rim at adjacent corners and within the overall dimensions of the lamp, make installation easy.

Each lamp can be operated at either 80 or 50 watts to give 4,800 or 2,900 lumens at efficiencies of 60 and 58 lumens per watt, respectively. Brightness at 80 watts is 3,200 ft-lamberts. And average life is 7,500 hours at either wattage.

Manufacture of the lamp requires molding two individual squares of glass. One serves as the configurated face plate.

The other, with an open trough looping six times across the lamp, forms the channel for the arc stream. General Electric Co., Nela Park, Cleveland 12, Ohio.

Ready-Mixed Cement Mortar

Another ready-mixed material has joined the long line of powdered instant products. The newcomer is Instant Crete, a preblended cement mortar that offers quality control, high strength and dollar savings.

Instant Crete is produced at 2½ tons per minute by a high-speed blending process. The process, called cyclo-blending, mixes cement, sand, lime, waterproofer, bonding chemicals, plasticity agents, an anti-efflorescence additive and a choice of coloring agents. According to the manufacturer, the mixture is so thoroughly blended that every grain of sand is coated with cement.

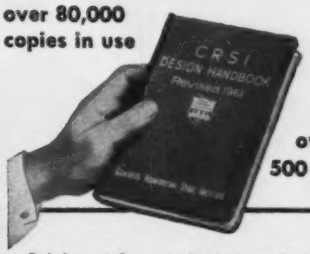
Result: guaranteed quality control on the job. All the mason does is add enough water to make the material plastic, then butter it on the building blocks. Other advantages: reduced wastage, consistency of batches, and increased productivity. The manufacturer claims that the average bricklayer can lay up to 25% more bricks per hour with Instant Crete.

In performance tests certified by the Medusa Portland Cement Co., mortar made with Instant Crete exhibited compressive strengths as high as 8,120 psi. And in waterproofing tests (in accordance with ASTM C-270) water retention characteristics were in the 75 to 83% range. A maximum of 4% absorption was recorded in tests made in accordance with Federal Specification SSC-181 c. Intant Crete Corp., 1130 E. St. George Ave., Linden, N. J.

The QUICKEST way to get

Reinforced Concrete Designs | Revised 1961... Second Edition... Fourth Printing

over 80,000 copies in use



over 500 pages

Reinforced Concrete Designs worked out in accordance with the latest A. C. I. Building Code. Fourth printing includes new column design tables using special large-size bars, #14S and #18S, in 60,000 and 75,000 psi yield point steels, plus additional information on Waffle Slabs. Send check or money order.

Prepared by the Committee on Engineering Practice

$6.00 postpaid

10-Day, Money Back Guarantee

NO C.O.D. ORDERS

CONCRETE REINFORCING STEEL INSTITUTE

38 S. Dearborn St. (Div. D), Chicago 3, Illinois

DEWATERING PROBLEM?

TEAR THIS AD OUT AND SLIP INTO YOUR POCKET NOTEBOOK

for fast Wellpoint Service, call one of these numbers:

LONG ISLAND CITY, N.Y.
EXETER 2-1100

CHICAGO, ILLINOIS
HILLTOP 5-8282

FT PIERCE FLORIDA
HOWARD 1-0500

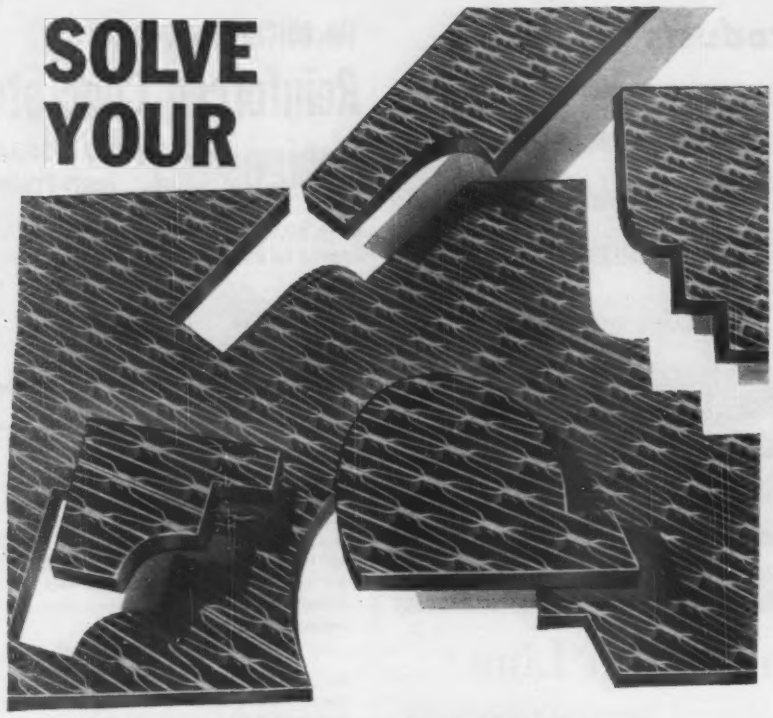
FOUNDATION WELLPOINT CORPORATION

Careful Soil Analysis ✓
Experienced Engineering ✓
Dependable Equipment ✓

LOOK FOR PRE-BID ESTIMATE
— NO OBLIGATION)

E F G H I J K L M N O P Q R S T U V W X Z

SOLVE YOUR



GRATING PUZZLE

If you need a grating that must fit around pipes and other objects, like a complicated jig-saw puzzle, there's one way you can be sure of getting panels that will fit perfectly into place—specify IRVICO.

IRVICO'S precise, custom fabrication eliminates costly field corrections and unnecessary handling of material. The grating is made in accordance with drawings approved by you. To assure easy installation, each panel is clearly marked to conform with erection drawings.

Whether your grating "puzzle" is simple or complex, you can depend on IRVICO to solve it so you can save time and money.

Write today for more information, or contact your Irving sales engineer, listed in the local phone directory.

Catalog on request

IRVICO **IRVING SUBWAY GRATING CO., Inc.**

The ***ORIGINATORS*** *OF THE GRATING INDUSTRY*
EST. 1902

Offices and Plants at: 5063 27th St., LONG ISLAND CITY 1, N. Y.
1863 10th St., OAKLAND 20, CALIFORNIA

Portable Elevator Gets Increased Safety Factors

Three safety improvements have been made on the Hawkeye portable personnel elevator, though it already meets typical insurance regulations and safety codes.

The new model, which travels on a monorail at 62 fpm, is powered in ascent and descent by a direct-drive, 10-hp motor.

Lift cables and power unit now are combined with a larger cable drum. The new drum is 24 in. in diameter, giving a 48:1 cable-to-drum ratio—thus minimizing bending stresses.

A new manual-stop safety device, with independent mechanical linkage, has been added to existing safety controls (over-speed governor, broken-cable stop).

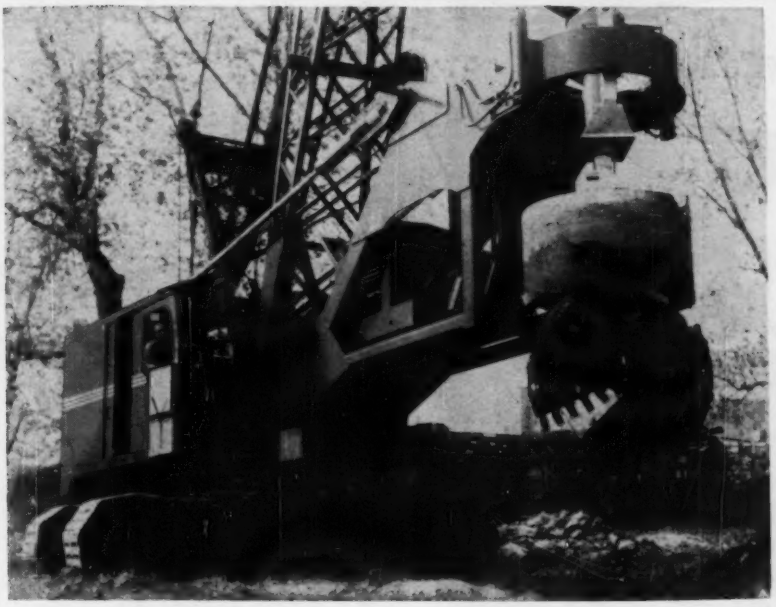
The elevator holds eight passengers, or 2,000 lb. It can be used for permanent and temporary setups, depending on column bracing and monorail installation. HAWKEYE PRODUCTS CORP., 212 DEY BUILDING, IOWA CITY, IOWA.

Fixed-Boom Unloader Lifts Like a Crane

Hi-Lo boom unloader, for bricks and other building materials, combines the advantages of a crane and a fixed-boom. Boom assembly, when mounted on a truck or trailer bed, rotates 360 deg and rises 60 deg from horizontal. Adjustable fork-lift assembly can be removed; wire slings and other material holders can be attached to lifting cables.

Movement of boom is remotely controlled by a cable-connected switch box.

Two-ton loads can be spotted 20 ft above ground, 15 ft below ground and 17 ft away from the mast center at ground. SIDE-O-MATIC UNLOADER CORP., P. O. BOX 1561, YORK, PA.



Changing a Crane to an Earthdrill

A bucket-type drill attachment is available that can convert any 1½-cu yd crawler or truck crane to a high-speed earthdrill.

Called the Series 150-C, the drill bores holes from 1 to 14 ft in diameter to depths of 200 ft at rates up to 60 ft per hr. Bucket capacity is 1½ cu yd. Holes may be vertical or slanted to a 1 to 3 batter.

The rig is a self-contained unit that can be operated independently of crane power. A gasoline or diesel engine is furnished.

The maker says the attachment can be mounted on the crane in less than 30 minutes. One man can operate the drill from controls placed in the cab of the crane.

A companion drill attachment, called the Series 100-C, is available for ¾ or 1-cu-yd crawler or truck cranes. CALWELD, INC., 7222 E. SLAUSON AVENUE, LOS ANGELES 22, CALIF.

Briefs . . .

Brick-size Vents

Cast-aluminum air intake or exhaust for unit air conditioners. 18 modular sizes. Fixed or operating louvers. Also can be used for ventilation of roof and crawl spaces, boiler rooms, bathrooms and kitchens. CONSTRUCTION SPECIALTIES INC., CRANFORD, N. J.

Roof Sealer

Wet-Seal, for repairing roof surfaces even when wet. Ready to use in solid or liquid form. Oil in sealer is compatible with water, stays waterproof when dry. REVERE CHEMICAL CORP., 2010 E. 102ND ST. CLEVELAND 6, OHIO.

Spray Pump

Portable slurry and texture gun, for paint, acoustical plaster, waterproofing and finish coats. Weighs, 125 lb; capacity 4,000 sq ft per day. $375 fob manufaceurer. AIR PLACEMENT EQUIPMENT CO., 1000 W. 25TH ST., KANSAS CITY 8, MO.

Shingle Shear

Dual purpose, for hand cutting and punching asbestos, slate and other shingles up to ¼ in. thick. Factory sharpening and repair for a low fee. With safety clip. KARL KLENK, INC., WILMINGTON 1, DEL.

Heat Pump

Three hp, model 3204. Cooling capacity 33,000 Btu/hr; heating capacity: 32,000 Btu/hr. Checklight shows when compressor is operating. Indoor, outdoor blowers work independently. CHRYSLER AIRTEMP, P.O. BOX 1037, DAYTON 1, OHIO.

Spray Pump

Air operated. For applying mastics, fibrated insulating and protective coatings, abrasive and acoustic materials, stucco finishes and high-viscosity cements. Will pump 30 to 40 bbl per day of emulsion through hose 300 to 400 ft long. Eight models. GROVER MFG. CO., 850 E. VALLEY BLVD., SAN GABRIEL, CALIF.

SOLVE YOUR GRATING PUZZLE

Every shipment of IRVICO grating is carefully checked and inspected to see that cutouts and sizes of panels are exactly in accordance with approved drawings.

When the job is delivered to you, the panels will fit into place easily and quickly, even where the application must be made like a jig-saw puzzle.

For more than half a century, the name Irving has meant grating fabrication under the rigid discipline of quality standards. Every job is treated individually, with considerable attention given to exact fit.

specify IRVICO

and you'll get

"A FITTING GRATING for EVERY PURPOSE!"

★

RIVETED

WELDED

PRESSURE-LOCKED

in steel, aluminum and other metals.

Catalog on request

IRVICO

IRVING SUBWAY GRATING CO., Inc.

Originators of The Grating Industry Est. 1902

Offices and Plants at:

5063 27th St., LONG ISLAND CITY 1, N.Y.

1863 10th St., OAKLAND 20, CALIFORNIA

make it last – make it LESCHEN

The man who uses wire rope knows that Leschen quality and service give best results—that Leschen Wire Rope keeps production on the move—that Leschen will make sure it's the right rope for his need. ▪ To be *safe* and *sure* call your Leschen distributor for expert advice on your wire rope needs. For further details and literature, write Leschen Wire Rope Division, 2727 Hamilton Avenue, St. Louis 12, Mo.

PORTER *LESCHEN WIRE ROPE DIVISION*
H. K. PORTER COMPANY INC.

Porter serves industry with steel, rubber and friction products, asbestos textiles, high voltage electrical equipment, electrical wire and cable, wiring systems, motors, fans, blowers, specialty alloys, paints, refractories, tools, forgings and pipe fittings, roll formings and stampings, wire rope and strand.

New Product Briefs

Jig Saw

Model 160 cuts at 3,200 strokes per minute through wood, plastic and composition materials; metal, at 2,600 strokes. Makes 2½-in. cuts in wood, ¾-in. in aluminum, and ¼-in. steel. Cost: $99.50, with four blades and rip fence. SKIL CORP., 5033 ELSTON AVE., CHICAGO 30, ILL.

Hoist Assembly

Attaches to standard scaffold. Lifting arms winch up and down, roll horizontally. UP-RIGHT SCAFFOLDS, 1013 PARDEE ST., BERKELY, CALIF.

Fork-Lift Truck

M-40 has an automatic transmission-and-clutch only 14 in. long. Two-speed, no clutch. Rear wheels independently suspended. Maximum lift: 4,000 lb up to 130 in. Fuels: gasoline or LP gas. MINNEAPOLIS-MOLINE CO., HOPKINS, MINN.

Daylighting Panels

Triple-reinforced glass-fiber laminate for roof and sidewall lighting. Bonding agent, 100% acrylic resin. In four colors; light transmission ranges from 60% to 80%. Panels nest with metal siding and roofing; no sash, no framing needed. OWENS-CORNING FIBERGLAS CORP., 717 FIFTH AVE., NEW YORK, N.Y.

Hand Drills

Two low-priced ball-bearing type electric drills, Model 70 (¼-in., 2.5 amp motor) at $22.50; Model 76 (⅜-in., 2.8 amp motor), $42.50. SKIL CORP., 5033 ELSTON AVE., CHICAGO 30, ILL.

High-Strength Form Tie

Safe load: 5,000 lb. Ultimate capacity: 7,000 lb. Tie holders and stud rods quickly, easily removed. SUPERIOR CONCRETE ACCESSORIES, INC., 9301 KING ST., FRANKLIN PARK, ILL.

Iron-Powder Electrode

Improved physical and mechanical properties. AWS class E-7018, for all position, ac-dc reverse polarity welding. Speedex HTS line has excellent impact strength. Deposits meet MIL Spec E-22200/1 for low-hydrogen electrodes. METAL & THERMIT CORP., GENERAL OFFICES, RAHWAY, N. J.

Nonslip Coating

Brush-on paint roughens metal, tile and other smooth walking surfaces exposed to weather. Available in white and colors, in two grades of roughness. AKRON PAINT & VARNISH CO., INDUSTRIAL FINISHES DIV., AKRON, OHIO.

Materials Prices

Monthly Market Quotations By ENR Field Reporters

See following ENR issues for OTHER PRICES:

- Wood Products, Glass, Explosives, Chemicals: Last, May 18; Next, June 22.
- Wage Rates Building Board Insulation: Last, May 4; Next, June 1
- Iron & Steel Products, Pipe: Last May 11; Next, June 15.
- Cement, Aggregate, Ready Mixed Concrete, Asphalt: Last, May 4; Next, June 8.

STRUCTURAL CLAY BUILDING TILE, BRICK AND LIME—DELIVERED

Item	Unit	Atlanta	Baltimore	Birmingham	Boston	Chicago	Cincinnati	Cleveland	Dallas	Denver	Detroit	Kansas City	Los Angeles	Minneapolis	New Orleans	New York	Philadelphia	Pittsburgh	St. Louis	San Francisco	Seattle	Montreal	Toronto
STRUCTURAL CLAY TILE																							
partition-scored																							
3x12x12 in.	M	$154.95pe	$217.00	$135.00pss	$232.00†	$137.00ll	$179.00mmjvv	$205.00ff	$162.00	$170.00	$257.00	$158.00 r	$218.00pe	$178.00	$236.00wwh	$258.00ss	$200.00t	$180.00mmpp	$156.85*	$235.00pt	$168.78Ruqoo	$169.00rr
4x12x12 in.	"	154.95pkke	231.00	152.00pss	248.00†mm	149.00ll	190.00mmjvv	219.00ff	162.00	185.00	274.00	158.00 r	225.00pe	178.00	315.00wwh	276.00ss	213.00t	199.00pp	177.10*	270.00pt	180.93auqoo	185.50rr
8x12x12 in.	"	309.90pe	434.00	.....	463.25†mm	280.00ll	355.00jddmm	410.00	318.75	310.00	514.00	312.00 r	452.00pe	371.25	378.00wwch	517.00sxx	400.00t	380.00pp	235.30dd	490.00pt	325.00ausqoo	360.00rr
Load Bearing—Scored																							
8x12x12 in.	"	387.40pe	491.00	303.00p	556.00†mm	.....	390.00jmmvv	465.00ff	387.00	310.00	582.00	312.00 r	225.00pwe	371.25	384.00wwhn	586.00ss	453.00t	410.00pp	159.40qq	265.00pwt	220.00qoo	281.50rr
10x12x12 in.	"	.....	602.00	376.00p	.....	.....	422.00jmmvv	.....	472.50	390.00	767.00	400.00 r	.....	.....	.....	.....	607.00t	440.00pp	.....	.....	400.00qoo	405.00rr
12x12x12 in.	"	.....	690.00	465.00p	.....	.....	500.00jmmvv	709.00ff	385.00	442.00	876.00	500.00 r	.....	.....	.....	.....	693.00t	621.50pp	.....	.....	.....	.....
BRICK, common backing	M	33.25uu	36.00	27.00†	43.50p	32.00	50.00jk	43.25tt	32.00	35.00xx	53.50pmm	34.00	$42.00uu	49.50vpe	42.00	46.00p	40.00mm	42.00t	44.00mmpp	43.00*	57.00t	48.25b	25.00rr
Straight hard	M	33.25uu	41.00	38.00jj	58.00p	34.00	49.00jk	47.25ggtt	53.00	54.00	54.00pmm	34.00	44.00	58.00vpe	55.00	.....	45.00mm	40.00t	45.50pp	43.00*	71.00t	56.30bjj	60.00rr
LIME, in paper, Hyd. fin.	"	42.50bh	35.80	38.28mm	42.00§	1.00aall	29.20jmm	32.75ptt	43.58	48.00p	38.00mm	36.26	38.00nnll	50.00bbe	48.00p	40.00p	40.00mmp	30.00t	1.00aapp	29.24	52.00bbt	39.00	34.00mm
" " Com hyd.	"	35.50bh	23.40	20.87mm	34.00§	0.90alaa	29.20jmm	28.00ptt	25.32	44.00p	30.00mm	34.26	38.00nnll	40.00bbe	40.00p	38.00p	24.50	26.00t	0.80aapp	29.24	38.00bbt	22.00	36.40mm
" " pulverized	"	.....	.....	26.33gmm	.....	.....	29.20jmm	.....	28.00	46.00p	40.00mm	29.76	39.00nnll	52.00bbde	.....	.....	27.50	34.00t	1.35zaapp	31.74	1.30mbbt	13.25	34.75mm

*§ F.o.b. yard. *° F.o.b. plant Stockton. *† F.o.b. yard Roxbury. *a Smooth. *b $4.50 del. *c 8 x 12 x 12 in.-6 cell. *d Pulverized hot. *e less 5% disc., 10th. *f 8 x 8 x 12. *g Lumps, $26.72. *h F.o.b. trucks, job site N.Y.C. *i 60 lb sacks. *j Truck load or over. *k $1.00 discount per M, 10 days. *m Per bb. 180 lb. processed. *n 7¾ x 7¾ x 12. *o Mason's double hydrated pressure. *p Truck lots. *q Provincial and Municipal tax extra (6%). *r Not used: earthquake danger. *s 8 x 16 x 12. *t less 2% disc., cash. *u Incl. Federal tax. *v Sand lime. *w 5 x 8 x 12. *x dumped. *y Chi common. *z Pebble; 80 lb sack. *aa 50 lb sack. *bb LCL. *dd 6 x 12 x 12. *ff 80% common. *gg Smooth. *hh less 25¢ disc., cash. *ii F.o.b. plant. *jj rough: smooth; $40. *kk 3½ x 11½ x 11½. *ll less 2% disc. 10th. *mm less 2% 10 days. *nn F.o.b., L. A. *oo less 2%, 30 days. *pp add 2% sales tax. *qq 8 x 8½ x 11½. *rr 2½% disc., 10 days. *ss 8% disc., 10 days. *tt less 2% disc., 15th. *uu less 50¢/M, 10 days. *vv 4000 pcs. and over. *ww New manufactured in porodic instead of tunnel kiln.

PAINT, ROOFING—F. O. B. CARLOAD LOTS

Item	Unit	Atlanta	Baltimore	Birmingham	Boston	Chicago	Cincinnati	Cleveland	Dallas	Denver	Detroit	Kansas City	Los Angeles	Minneapolis	New Orleans	New York	Philadelphia	Pittsburgh	St. Louis K	San Francisco	Seattle	Montreal	Toronto
LEAD, red, dry	CWT	$14.75/15.10ggJO	$17.50pp	$26.00†J	$24.95†oomm	$15.25rjqqpp	$15.25†JO	$25.65†	$22.50	$23.85n	$15.95r	$26.90ggool	$16.25yy	$16.25N	$23.00Jpp	$14.75ooO	$14.75mmO	$21.50mggJ	$25.65†m	$26.70mm	$13.35HO	$19.45O	$13.95
White, in oil	"	24.00ggJ	24.00	29.00†J	26.90†mmm	24.00†J	24.00†J	26.90†	23.50M	24.00	24.00rr	25.65	22.00	21.50kk	24.00J	29.75	19.00mm	24.00J	26.90	29.90mm	24.00H	26.00wtt	20.85
READY-MIXED PAINT																							
Graphite b.	gal	....	3.00	3.90J	.....	.....	.....	3.16ggP	.....	3.70	....mm	3.99	3.30	.....	.....	.....	3.35mm	2.20#EJ	.....	3.20mm	.....	5.52Dfft	5.15J
Aluminum	"	4.10	4.40	3.40J	.....	.....	.....	3.27zzgg	3.25B	5.10	....mm	3.43	4.50n	.....	.....	.....	3.90mm	2.25#FJ	.....	4.30mm	4.19ceffJ	6.55xff	6.18J
Ferric Oxide	"	3.31	3.50	.....	.....	.....	.....	4.20qgg	.....	.....	....mm	3.01	4.20n	.....	.....	.....	3.65mm	2.25#GJ	.....	3.50mm	.....	5.10kfft	5.95J
ROOFING SUPPLIES	square	2.90kk	3.06	2.95†mm	3.55q	3.45ukk	2.99mm	2.85q	3.00u	2.94	2.85mm	3.00mm	3.40nkk	2.85kk	$2.78	2.99xx	.....	2.90sH	2.99iismm	2.87mm	3.70ccH	5.40	3.50
Rolls, slate surf.	CWT	2.20kk	3.67	2.17ii†mm	2.60q	2.75okk	2.19mm	2.10oo	3.00o	2.25o	2.10ommll	2.50omm	2.40njkk	2.10hikk	1.98	2.19xxo	2.65	2.15sH	2.19hhK	1.72aaiimm	3.06bccH	4.65f	2.40aac
Asphalt felt	"	2.85kk	4.04	3.17ii†mm	3.04q	3.15okk	2.64omm	2.55o	3.00o	2.80o	2.55ommll	2.50omm	.....	2.55bikk	2.85	2.64o	1.81	2.15H	2.64hhK	2.59mm	.....	4.65f	2.40o
Asphalt coating	gal.	0.67kk	0.50	0.76ffmm	0.55q	48.00bbkk	0.56ymm	0.41y	0.47O	0.50f†	0.56ffmm	0.55y	0.75nykk	0.52ikk	0.68	0.52s	0.74	0.56H	0.58yK	0.46jj	0.59cc	1.60	0.70j
Tar pitch	ton	65.35kk	54.00	48.00eemm	60.00q	57.70†kk	57.96Hmm	49.00gg	66.00hh	50.00	49.00mm	.....	s.....	50.00rkk	45.50	49.00*	49.00	55.00H	57.60K	54.00	.....	4.40uu	50.00A

*† Delivered. * Note: Red lead in oil 50% higher than white lead in oil. *° Aver. wt. approx. 425 to 550 lb drums. *a Red lead prices change frequently due to pig lead price changes. *b U.S. War Dept. Spec. 3-49A. *c ASTM Spec. D266-31. *d 80% minimum ferric oxide. *e Per 108 sf roll. *f Per 432 sq ft. *g F.o.b. yard Roxbury. *h Per roll, 65 lb. *i Net carload prices, Minneapolis and vicinity. *j 45 gal containers. *k Over 80% ferric oxide. *l Not used. *m 100 lb keg. *n F.o.b. city. *o Per 60 lb roll. *p 6-drum, 50 gal each. *q Per 90-lb roll. *r F.o.b. factory, Chicago. *s Truckload. *t Incl. Federal tax. *u Per 90-lb square. *v Per ton. *x Ready-mixed. *y 55-gal container. *z Drums. *aa 15 lb. *bb Roofers coating and cement. *cc LCL, truck delivery. *ee Asphalt pitch in 100 lb package. *ff 5-ga drums. *gg F.o.b. factory. *hh Incl. freight. *ii Per 324 sf roll. *jj Asbestos roof coating. *kk less 2% disc., 10th. *mm less 2% disc., 10 days. *oo 100 lb bbls. *pp 50 or 100 lb bags. *qq 500 lbs or more. *rr F.o.b. plant, Detroit. *ss 50 lb bbls. *tt 25 lb kegs. *uu 250 lb bbls. *xx Sept.: Rolls revised to $2.75, Asph. Felt revised to 1.71. *yy Sept. revised to $12.00. *zz Sept. revised to $2.80. *A 400 lb barrels. *B ASTM Spec. D962-49. *C 95%. *D Std. black. *E TTP27; *F TTY81; *G TTP31. *H less 2% disc., cash. *I Per 100 lb. *J less 1% disc., 10 days. *K add 2% sales tax. *L CL. *M 1 ton or more. *N under 500 lbs, add $1. *O 50 lb. bag.

PLASTER, VERMICULITE AND METAL BUILDING SHEETS

Item	Unit	Atlanta	Baltimore	Birmingham	Boston	Chicago	Cincinnati	Cleveland	Dallas	Denver	Detroit	Kansas City	Los Angeles	Minneapolis	New Orleans	New York	Philadelphia	Pittsburgh	St. Louisuu	San Francisco	Seattle	Montreal	Toronto
PLASTER, neat	ton	$33.00ss	$24.00	$37.00ss	$26.00	$1.45bbtt	$24.95*ss	$29.00*ss	$34.50	$29.00	$28.00ss	$30.00	$28.00tt	$36.00F	$34.00	$27.00	$27.00	$30.00nn	$30.00	$29.50ss	$42.40nn	$22.60h	$0.70bb
gauging	"	45.00ss	35.70	43.00ss	30.00	1.45bbtt	24.95*	45.00N	34.50	29.00	28.00ss	35.00	29.00tt	36.00F	48.00	35.00	33.00ss	31.00nn	42.00	30.50ss	45.60nn	35.60h	1.25bb
VERMICULITE																							
Home insul. pellets	4 cf bag	1.65sss	0.95	1.55ss	1.40	1.55	1.75*ss	1.14ss	1.05	1.63	1.27ss	1.19E	1.25	1.65tt	1.32P	1.35	1.40ss	1.25nn	1.50	1.38ss	1.55nn	1.25b	1.47bb
plaster agg.	"	1.65sss	....	1.55ss	1.40	1.60	1.75*ss	1.16ss	1.21	1.40	1.31ss	1.21E	1.20ktt	1.80F	1.23P	1.38	1.25ss	1.30nn	1.60	1.38ss	1.35knn	1.40h	1.43bb
concrete agg. treated	"	1.85sss	....	1.60ss	1.40	1.60	1.85*ss	1.24ss	1.37	1.50l	1.40ss	1.29E	1.45	1.95Fl	1.40P	1.50	1.45ss	1.40mm	1.65	1.50ss	1.85lnn	1.60h	1.66bb
PERLITE, plaster agg.	"	1.65ss	1.15	1.27ss	1.55ss	1.60	1.75ss	1.45ss	1.21	1.50ss	1.45kii	1.21	1.16	1.40S	1.15P	1.45	1.05ss	1.40nn	1.50	1.38ss	1.50k	1.15v	1.14Q
concrete agg. untreat.	"	1.65ss	1.55	1.27ssl	1.55ss	1.60	1.75ss	1.45ss	1.32	1.60ss	1.50kii	.....	1.26	1.50S	1.15P	1.40	1.05qqss	1.40nn	1.60	1.58ss	.....	1.15v	.....
BUILDING SHEET																							
Alum. flat, .100"	lb	0.469noo	0.462	0.459M	0.474	0.564x	0.469	0.459ss	0.469	0.479	0.475a	0.463	0.459	0.469	0.469	0.489aT	0.479	0.475	0.479	0.575	0.50D	43.95AH	0.4375
corr. roof, .032"	sheet	27.17nY	0.451r	9.66K	25.07AAp	33.43p	9.35	25.07p	0.484r	10.89	10.35a	24.66ggyyp	8.772Z	10.09	33.43	0.2507aXAA	10.98	10.39	9.18	10.83	10.75D	12.10H	26.00ap
Stainless steel, 20 ga	CWT	64.44nxx	63.00	64.50K	64.42*ddxx	64.15ee	61.00xx	63.33ooxx	64.09	65.32gg	63.00axx*	67.50E	67.77	63.61GR	63.00Y	64.08a	63.71	63.00	63.39Kmmgg	65.00K	54.02D	65.75H	73.74
28ga	"	72.69nxx	71.25	73.00K	72.67dd	72.40ee	71.25xx	71.58ooxx	72.34	73.57gg	71.25axx*	76.25E	73.27	69.61ffG	83.50Y	73.33	71.96	74.50pp	71.64ygg	77.25K	73.27D	.....	86.52

*‡ truckiots, delivered *† fob warehouse. *° ob city. *a delivered. *b ½" O.D. *c ¾" O.D. *d per sl. *e 34" x 60" sheet. *f per 100 ft. *g 5 tons & up; cold roll, anneal & pickled 2B finish. *h incl. Federal tax. *i add 25¢ for pint of additive. *j 1100 & 3003 alloy, mill finish. *k bag of 3 cu ft. * treated with air entraining agent. *m 2-10M ft. *n fob mill if equalized with nearest stocking competitor. *o 250 sacks or more. *p 100 sq ft. *r per lb. *s 30 lb bag. *t 36" x 108"; 10.81 lb/sh; 48" x 144"; 21.7 lb/sh. *u 19.31 lb/sh. *v fob plant. *w 48 x 144" *x 0.11"th. *y 27 gauge *aa 18M lb & up. *bb Per 50 lb bag. *dd add $1.00 cwt boxing. *ee 5 tons & up. *gg add $2/cwt boxing; $0.75/cwt on skids. *hh Theoretical wt for 48" x 96"; 60.4-lb per sh. *‡ 300-bag lots *ii 100-lb bag *mm Theoretical wt: 19.7-lb per sh *nn 2% cash *oo skid packed. *pp type 304 *qq Philadelphia and suburbs. *rr less 2% disc. 15 days. *ss less 2% disc. 10 days. *tt less 2% disc. 10th. *uu add 2% sales tax. *vv Type N. *xx less ½% disc. 10 days. *yy .021 ga. *zz .061" th. *A Per 100 lb. *C 15M lb. *D less ½% for cash. *E Quantity differential. *F less 9% disc. 10th. *G less ½% disc. 10th. *H Fed. tax exempt. *K less ½% 10 days. *L 5% disc. 30 days. *M 3003: .452 for 1100. *N less 2%, 15th mo. *O less $2, cash & carry. *P less 2% 15 days. *Q per ton. *R revised. *S add .10/bag under 200 bags. *T 5000# quantity on 4000# skids. *U 30 Msf quantity; $0.245 in 10 Msf quantity. *X per sq ft. *Y per sheet. *Z 6,000 lb or over. *AA 30,000 sf or over.

Bids Asked—Low Bidders—Contracts Awarded—

NEW ENGLAND

BUILDINGS—BA

▲ **R. I., Portsmouth**—BA 6/2—Sisters of Our Lady of Providence, c/o Most Rev. Russell J. McVinney, DD-Bishop of Providence, 34 Fenner St. (selected list of bidders), Mother of Hope NOVITIATE, West Main Rd. $1,500,000. William M. O'Rourke, 90 Union St., Warren, archt. CD 1/30/61.

▲ **Mass., Amherst**—BA 6/9—Commonwealth Mass., Dpt. Educ., Div. Bldg. Constr., 38 Chauncy St., Boston, Proj. U-59-2, Contr. 1, NATURAL RESOURCES BLDG., University of Massachusetts. $1,596,577. Plans deposit $100. M. A. Dyer Co., 24 School St., Boston, archt. CD 1/20/59.

BUILDINGS—SLC

▲ **Mass., Worcester**—Memorial Hospital, 119 Belmont St., soon lets contract HOSPITAL ADDN., ALTERATIONS, Kendall St. $1,500,000. Perkins & Will, 55 Church St., White Plains, N. Y., archts. G. Adolph Johnson, Inc., 82 Foster St., assoc. archt. Garfinkel & Marenberg, 100 W. 42 St., New York, N. Y., engrs. CD 5/2/61.

HEAVY CONSTRUCTION—LB & CA

▲ **MAINE**—State Hy, Comm., Augusta, BRIDGE, **Ellis C. Snodgrass, Inc.**, 465 Congress St., Portland, Me., CA **$1,568,003** (8 bidders) Passagassawaukeag River Bridge, Belfast, Rte. US 1, Proj. BU-026-2(1), Contr. 1, Waldo Co. BA 5/10. CD 4/18/61.

▲† **Electronic & Missile Facilities, Inc.**, 2 LaFayette St., New York 7, N. Y., LB **$1,776,000** (14 bidders), AIR ROUTE TRAFFIC CONTROL CENTER, Nashua By-pass-Dunstable and E. Dunstable Rds., NASHUA, N. H. Federal Aviation Agency, Federal Bldg. No. 347, New York International Airport, Jamaica, N. Y. BA 5/15/61. CD 4/5/61.

▲ **VERMONT**—State Hy. Dpt., State House, Montpelier, Bids opened 5/12, ROAD,
Fabi & Sons, Ltd., 800 King St., Sherbrooke, P. Q., Canada, LB **$1,545,718**, est. $640,000, highway and two bridges, Interstate Rte. No. 91, Proj. 1-91-3, Derby. CD 4/10/61.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

▲ **Pa., West Chester**—BA 6/1—West Goshen Sewer Authority, Route 202, SECONDARY SEWER PLANT, etc. $2,225,000. Extended date. Glace & Glace, 2771 Paxton St., Harrisburg, engrs. CD 5/3/61.

▲ **New York**—BA 6/13—President Queens Boro, Boro Hall, 228-120-55 Queens Blvd., Kew Gardens, 24, GRADING, PAVING, constr. grade separation structures, retaining walls, curbs, walks, drainage facilities, electrical sys. and landscaping Brooklyn-Queens Expressway (Connecting Hy.) from Woodside Ave. to 64 St., exclusive of Long Island RR Bridge, Queens Boro. Plans deposit $100. CD 3/23/60.

BUILDINGS—BA

▲ **Md., Baltimore**—BA 6/1—Johns Hopkins Hospital, Broadway and Monument St., (selected list bidders) Children's MEDICAL and SURGICAL CENTER. $6,-000,000. Jas. R. Edmunds Jr., 1025 St. Paul St., Zone 2, archt. CD 12/17/58.

▲ **N. J., New Brunswick**—BA 6/1—Office of the Vice President and Treasurer, Room 101, Queens Bldg., Rutgers, State University, Contr. 1, general constr., Contr. 2, structural steel, misc. iron work, Contr. 3, heating and ventilating work. Contr. 4, plumbing work, Contr. 5, electrical work, STADIUM FIELD HOUSE ADDN., for Rutgers, The State University. Plans deposit $50. Woerner & Woerner, The Feher Bldg., 103 Bayard St., archts. CD 10/1/45.

HEAVY CONSTRUCTION—LB & CA

▲ **NEW JERSEY**—State Hy. Dpt., 1035 Parkway Ave., Trenton, Bids opened 5/11, ROAD,
George M. Brewster & Son, 275 West Fort Lee Rd., Bogota, N. J., LB **$3,119,916**, (5 bidders), preparing roadbed for future constr. of Interstate Rte. 95 and future connection with New Jersey Turnpike and Rte. 46, Ridgefield Park, Bergen Co. CD 4/20/61.

BUILDINGS—LB & CA

▲ **John Kennedy & Co., Inc.**, 205 E. 42 St., New York 17, N. Y., CA Est. **$4,500,000**, 1,800 student Bishop Ford HIGH SCHOOL, Prospect Park West and 20 St., BROOKLYN, N. Y. Diocese of Brooklyn, 191 Joralemon St., Brooklyn 2, N. Y. BA 5/9. CD 4/27/61.

▲ **V. B. Constr. Co., Inc.**, 157 Sunnyfield St., Scarsdale, N. Y., LB **$2,643,559**, (11 bidders), general contract DORMITORIES and MESS HALL for Maritime College, Fort Schuyler, NEW YORK, N. Y. Dormitory Authority of New York State, Normanskill Blvd., Elsmere, N. Y. BA 5/9. CD 5/2/61.

▲ **Sheppard-Pollak, Inc.**, 18 E. 48 St., New York 17, N. Y., CA Est. **$2,944,200**, 19 story, 180 unit Monterey Towers APARTMENT, Monterey Ave., Lafontaine Ave., E. 180 St., E. 181 St., Bronx Boro, NEW YORK, N. Y. John Pollak, 18 E. 48 St., New York 17, N. Y. CD 3/29/61.

▲ **Robert Glenn, Inc.**, 101 Park Ave., New York 17, N. Y., CA Est. **$2,500,000**, 3 story 125,000 sq. ft. DEPT. STORE ADDN., incl. 3,000 sq. ft. AUDITORIUM, 220 Main St., WHITE PLAINS, N. Y. Macy's New York, Herald Square, New York 1, N. Y. Lathrop Douglass, 518 Fifth Ave., New York 18, N. Y., archt.

▲ **Dimar Bros.**, 1330 Main Ave., Clifton, N. J., and **South Jersey Land Co**, Berkeley Heights, N. J., CA est. **$5,200,000**, 500 addnl. HOUSES, and SWIMMING POOL, Sloop Creek Rd., BAYVILLE, N. J. Hydrocarbon Realty Development Co., 24th W. 58th St., New York, N. Y. Serge Padiukow, 230 Main St., Toms River, N. J., and Paul West, 911 N. Main St., Toms River, N. J., archts.

▲ **Hand-Sum Homes**, 10 South Harrison St., East Orange, N. J., Owner Builds, **$2,000,000**, 85 HOUSES, Briarwood Dr., BERKELEY HEIGHTS, N. J. Rotwein & Blake, 1018 Stuyvesant Ave., Union, N. J., archts.

▲ **Vincent J. Verra**, 351 Turnabout Circle, Mountainside, N. J., Owner Builds, **$1,750,000**, 55 HOUSES, Lake Avenue Section, CLARK, N. J. Benoist & Goldbert, 5 Valentine St., Monmouth Beach, N. J., archts.

▲ **William L. Blanchard Co.**, 45 Poinier St., Newark, N. J., CA Est. **$2,500,000**, DEPARTMENT STORE, in Delaware Twp., HADDONFIELD, N. J. L. Bamberger & Co., 131 Market St., Newark, N. J. Abbott Merkt & Co., 630 3rd Ave., New York, N. Y., archts.

▲ **B. Bornstein & Son**, 2027 Arch St., Phila., Pa., CA **$1,587,500**, general contract Wissohickon SENIOR HIGH SCHOOL, AMBLER, PA. Ambler Joint School Authority, Ambler, Pa. BA 4/27/61. CD 4/13/61.

▲ **Fleming Co.**, Wynnewood, Pa., CA **$1,589,177**, general contract SENIOR HIGH SCHOOL, BERWYN, PA. Paoli Area School Authority, Berwyn, Pa. BA 3/39/61. CD 4/10/61, under LB.

▲ **Feinstein & Cardonick**, c/o 1135 Englewood St., Phila., Pa., Owner Builds, **$3,500,000**. $1,750,000 1st year, two years to complete, 226 RESIDENTIAL DEVELOPMENTS, Rising Sun Ave. and Phawn St., PHILA., PA.

▲ **Nason & Cullen, Inc.**, 6525 Vine St., Phila., Pa., CA **$2,190,000**, IN-PATIENT HOSPITAL, PHILA., PA. St. Christopher's Hospital, 2600 N. Lawrence St., Phila., Pa. BA 4/18/61. CD 4/24/61, under LB.

▲ **Mellon-Stuart Co.**, 210 E. Parkway, Pittsburgh, Pa., CA Est. **$2,250,000**, 9 story, brick, Bristol APARTMENT and GARAGE, N. Bellefield between 5th Ave. and Bayard St., PITTSBURGH, PA. Sponsors, Inc., c/o Douden & Associates, archts., Clark Bldg., Pittsburgh, Pa.

▲ **One Township Line, Inc.**, 6758 Market St., Upper Darby, Pa., Owner Builds, **$1,500,000**, APARTMENT, Township Line, UPPER DARBY, PA. Raymond Di Paola, Media, Pa., archt.

SOUTH

HEAVY CONSTRUCTION—BA

▲ **Va., Newport News**—BA 6/14—City Council Chamber, Municipal Bldg., 108 Main St.,
Contract 1, general contract, rolled fill DIASCUND DAM, approx. 5,670 ft. long and 37 ft. high, PUMPING STATION and appurtenances for Diascund Water Project, approx. 15 mi. northwest of Williamsburg, Plans deposit $30.
Contract 2, mechanical equipment, two VERTICAL TURBINE PUMPING UNITS, pipe and fitting; sluice gates, valves, well screening equipment, metering equipment and air compressor. Plans deposit $20.
Contract 3, electrical work, high voltage SWITCHGEAR for reduced voltage starting two 600 HP motors, low voltage switchgear and wiring for power, lighting and control systems, Plans deposit $20.
Contract 5, transmission main, rein.-con. PRESSURE PIPE LINE from Station 0 plus 00 to Station 510 plus 10, approx. 10 mi. along northerly side of Virginia Electric Power Company (VEPCO) right of way terminating approx. 750 ft. easterly from Rte. 658. Plans deposit $30. Malcolm Pirnie Engineers, 25 West 43rd St., New York 36, N. Y., engrs. CD 11/10/59.

▲† **West Virginia**—BA 6/20—U. S. Eng., 925 New Federal Bldg., Pittsburgh 19, Pa., contr. LOCK, Opekiska Lock and Dam, Monongahela River, ENG-36-058-61-38, $10,000,000. Plans deposit $10. CD 11/10/60.

▲† **Fla., Miami**—BA 6/23—Federal Aviation Agency, Second Regional Office, Box 1689, Fort Worth, Tex., Air Route TRAFFIC CONTROL CENTER BLDG., NW of Miami International Airport, at Palmetto By-Pass and NW 58 St., Proposal 2-61-156. $1,-750,000. Extended date. Steward-Skinner & Assoc., DuPont Plaza Center, archts., CD 5/9/61.

BUILDINGS—BA

▲ **Tenn., Nashville**—BA 6/14—General Shoe Corp., 111 7th Ave. N., 490,000 sq. ft., SHOE MFG. PLANT, Over $2,500,000. Plans deposit $800. John Charles Wheeler, 2000 Warfield Drive, archt. I. C. Thomasson & Assocs., 809 16th Ave. S., engrs. CD 12/23/58.

▲ **La., New Orleans**—BA 6/15—Touro Infirmary, 3516 Prytania St., rein.-con. INFIRMARY ALTERATIONS, ADDNS. $3,500,000. Curtis & Davis, 2475 Canal St., archts. CD 4/5/61.

▲† **Fla., Mayport**—BA 6/22—Southeast Division-Bureau Yards & Docks, Bldg. 13, U. S. Naval Base, Charleston, S. C., 540 units CAPEHART HOUSING PROJECT, U. S. Naval Station, NBy-(CH)-37375, Spec. 37275/61. Plans deposit $75. CD 11/15/60.

▲ **N. C., Winston-Salem**—BA 7/6—Bd. Comrs., Forsyth Co. Courthouse, 10 story, 338,068 sq. ft., Forsyth General HOSPITAL, $10,000,000. Extended date. Lashmit, James, Brown & Pollock, 865 W. 4½ St., archts. CD 4/13/61.

BUILDINGS—SLC

▲ **Ala., Gadsden**—Baptist Memorial Hospital, 1137 7th Ave., soon lets contract HOSPITAL, $2,400,000. Charles H. McCauley, 1917 5th Ave. S., Birmingham, archt. CD 5/9/61.

HEAVY CONSTRUCTION—LB & CA

▲ **Glenn Constr. Co.**, 501 E. Morehead St., Charlotte, N. C., CA **$1,552,087**, general contract SEWAGE TREATMENT PLANT, ALBEMARLE, N. C. City, City Hall, Albemarle, N. C. BA 4/12/61. CD 4/20/61, under LB.

▲ **KENTUCKY and OHIO**—Commonwealth of Ky., Dpt. Hys., Frankfort, Ky., bids opened 5/12, BRIDGE, **U. S. Steel Corp.**, Rm. 3004, 525 Wiliam Penn Pl., Pittsburgh, Pa., LB **$3,877,892**, (5 bidders), bridge (superstructure) over Ohio River between Covington, Ky. and Cincinnati, O., 0.328 mi. EI 75-B (11) 190, SP 59-315, Kenton Co., Ky. CD 4/25/61.

BUILDINGS—LB & CA

▲ **Allen Bros. & O'Hara, Inc.**, 3742 Lamar Ave., Memphis, Tenn., CA Est. **$2,000,000**, 5 story, 46 x 330 ft. MOTEL, Kanawha Blvd., CHARLESTON, W. VA. Stanton Enterprises, c/o contractor.

▲ **D. H. Foster, Paul J. Kortsh & Jack Williams**, 3836 Central Ave., St. Petersburg, Fla., CA **$2,-088,777**, 250 unit HOUSING, Fla. 41-1 and 41-2, FORT PIERCE, FLA. Fort Pierce Housing Auth., 435 North 7th St., Fort Pierce, Fla. BA 5/3/61. CD 5/9/61, under LB.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

▲† **Michigan**—BA 6/14—U. S. Eng., 1101 Washington Blvd., Detroit, Zone 26, DREDGING CHANNEL between Mackinac Island and Round Island, Straits of Mackinac, CIVENG-20-064-61-65. Under $2,000,-000. Plans deposit $2. CD 4/20/61.

BUILDINGS—BA

▲ **Ill., Chicago**—BA 6/1—University of Chicago, 5801 Ellis Ave., 6 story, Phillip D. Armour RESEARCH BLDG., 58th St. and Ellis Ave. $3,000,000. Schmidt, Garden & Erickson, 104 S. Michigan Ave., Zone 3, archts. CD 7/31/59.

▲ **O., Cleveland**—BA 6/7—Sheraton Corp., 470 Atlantic Ave., Boston, Mass., (selected list of bidders) BALLROOM, Sheraton Hotel. $1,500,000. Perry, Shaw, Hepburn & Dean, 31 St. James Ave., Boston, Mass., archts. CD 11/11/59.

▲ **O., Cleveland**—BA 6/8—Addressograph-Multigraph Corp., 1200 Babbitt Rd., Zone 32, 301,000 sq. ft., chrome plating PLANT ADDN., etc., $3,500,000. Dalton-Dalton Associates, The Arcade, Zone 14, archts. CD 2/10/60.

▲ **O., Columbus**—BA 6/8—Columbus Metropolitan Housing Auth., 425 W. Rich St., Zone 22, 11 story low rent APARTMENT and 1 story Senior Citizens RECREATION BLDG., Ohio 1-6. Plans deposit $100. Inscho, Brand & Inscho, 60 E. Broad St., Zone 15, archts. CD 3/21/61.

▲ **Wis., Madison**—BA 6/8—Regents of the University of Wisconsin, GENETICS BLDG. $1,800,000. Plans deposit $50. Siberz, Purcell & Cuthbert, 1920 Monroe St., archts.

▲ **O., Chillicothe**—BA 6/20—Bd. Educ., Chillicothe, HIGH SCHOOL. $2,500,000. CD 11/19/57.

HEAVY CONSTRUCTION—LB & CA

▲ **OHIO**—State Hy. Comn., State Dpts. Bldg., Columbus, Zone 15, ROADS,
O.—**Bates & Rogers Constr. Corp.**, 600 W. Jackson Blvd., Chicago, Ill., CA **$1,056,486**, Type T 35 on B 19 and structure 1.465 mi. State Rte. 528, Section 1.24, S 34 (4) Madison Twps., Proj. 197, Lake Co.; CA **$844,349**, Type T 34 on B 19 and structure, 0.567 mi. US Rte. 25, Section 7.12, I 75-1(45)46, Miami Twp., Proj. 203, Montgomery Co.,
O.—**Silvestri Bros.**, 713 Andrews Ave., Youngstown, O., CA **$821,007**, Type T 71 and structures, 0.682 mi. S. R. 7, Section 14.35, I 680-9(5)224, City of Youngstown, Proj. 202, Mahoning Co.;
O.—**Frank Mashuda Companies, Associated**, 5556 W. Roosevelt Dr., Milwaukee, Wis., CA **$3,187,253**, Type T 71 and structure, 3.633 mi. US Rte. 40, Sections 5.58, 5.84 (Parts Nos. 1 and 2) S-SG-1338(1), I 70-7(8)177, Part No. 1, Cambridge Twps., Part No. 2, Cambridge Twp. Proj. 196, Guernsey Co. Grand total $5,889,095. BA 4/25/61. CD 5/5/61 under LB.

▲ **Boam Co., Inc.,** 3144 W. Eight Mile Rd., Livonia, Mich., and **Rocco Ferrare & Co.,** 30105 W. Eight Mile Rd., Detroit, Mich., CA **$4,440,566,** Red Run DIVERSION CONDUIT and Mahoning River INTERCEPTOR SEWER, WARREN, O., City, City Hall, Warren, O. BA 3/16/61, CA 5/5/61. CD 3/22/61, under LB.

▲ **WISCONSIN**—State Hy. Dpt., Rm. 534, State Office Bldg., Madison, BRIDGES,

Wis.—**A. R. Coffeen Co.,** P.O. Box 135, Hartford, Wis., CA **$105,167,** Structures B 13-176 and B 13-177 0.025 mi. Contract 4 Madison Janesville Maple Grove Rd., South County Line Section on 190, Contract 1146, Dane Co.; CA **$151,250,** Structures B 13-203 and B 13-135 0.029 mi. Contract 2 USH 151, IH 90 Rd. on STH 30, Contract 1147, Dane Co.;

Wis.—**Warden & Perrenoud, Inc.,** 3048 Midway St., Eau Claire, Wis., CA **$93,697,** grading, subbase base course, Structure B 47-33, Rush River Bridge and approach, on STH 29, Contract 1, Contract 1151, Pierce Co.;

Wis.—**L. G. Arnold, Inc.,** P.O. Box 228, Eau Claire, Wis., CA **$1,771,064,** Structure B 40-115 0.278 mi. Contract 1, North-South Expressway CMSTP and P RR Yard overpass, Milwaukee and Glendale, Contract 1149, Milwaukee Co.;

Wis.—**Bridge Builders, Inc.,** 1225 Tower Ave., Superior, Wis., CA **$773,590,** Structures B 16-10, B 16-11 and B 16-12, Contract 1, Bay St. overpass and Hill Ave. overpass, USH 53, Superior, Wis., Contract 1153, Douglas Co.;

Wis.—**Harold B. Janke,** Fredonia, Wis., CA **$152,723,** Structures, Contract 3, Madison-Janesville Rd., Maple Grove Rd.., South County Line Section, on 190, Contract 1145, Dane Co. Grand total $3,047,490. BA 5/9/61. CD 4/11/61.

▲ **MICHIGAN**—State Hy. Dpt., 732 Mason Bldg., Lansing, ROADS,

Mich.—**C. J. Rogers,** 148346 Grand River, Detroit 27, Mich., **Cooke Contracting Co.,** 1116 Penobscot Bldg., Detroit 26, Mich. and **Jutton-Kelly,** 13240 Alber Dr., Dearborn, Mich., CA **$3,196,206,** ¼ mi. Chrysler Freeway from Alexandrine north to Warren incl. bridges at Warren and Canfield and Utility alterations, Detroit, Wayne Co.;

Mich.—**O. E. Gooding Co.,** 5800 Cherry Hill Rd., Ypsilanti, Mich., CA **$809,542,** 12.4 mi. modernization on M-53 from Imlay City to Burnside incl. grading, drainage structures, wid'n. from 20 to 24 ft. and paving, Lapeer Co. BA 4/18. CD 4/25/61, under LB.

BUILDINGS—LB & CA

▲ **English Development,** 9140 Brecksville Rd., Brecksville, O., Owner Builds, **$5,000,000,** twenty-one 2 story 304-unio APARTMENTS, Brecksville Rd. between Fairview and Whitewood Rds., swimming pool, 32 acre site, BRECKSVILLE, O. Andonian & Ruzsa, The Arcade, Cleveland, O., archts.

▲ **Austin Co.,** 2650 Mayfield St., Cleveland, O., CA Est. **$5,000,000,** design and construct 150,000 sq. ft. Paper Box Mfg. PLANT, Princeton Pike and Circle Freeway, CINCINNATI, O. Lord Baltimore Press, sub. International Paper Co., 425 Park Ave., New York, N. Y.

▲ **Dravo Corp.,** Neville Island, Pittsburgh, Pa., installing third 125,000 kw. GENERATING UNIT in Conesville Power Station, CONESVILLE, O. Columbus & Southern Ohio Electric Co., 217 N. Front St., Columbus, O. CD 10/12/60, under CA.

▲ **Living Homes, Inc.,** 13757 Cedar Rd., Cleveland Heights, O., Owner Builds, **$4,725,000,** 225 HOMES in Hometown Park, MENTOR, O.

▲ **J. L. Simmons Co.,** Inland Bldg., Indianapolis, Ind., CA Est. **$1,500,000,** general contract 3 story Jordan COLLEGE of MUSIC, North 3 corner 46th and Clarendon, INDIANAPOLIS, IND. Butler University, Indianapolis, Ind. McGuire & Shook, Compton, Richey & Assocs., I.S.T.A. Center, Indianapolis, Ind., archts. CD 1/15/59.

▲ **William E. Schweitzer & Co.,** 2207 Dodge Ave., Evanston, Ill., CA **$5,000,000,** TECHNOLOGY INSTITUTE ADDN., EVANSTON, ILL. Northwestern University, 619 Clark St., Evanston, Ill. BA 4/20/61, CA 5/3/61. CD 4/12/61.

▲ **George A. Fuller Co.,** 111 W. Washington St., Chicago 2, Ill., CA **$3,000,000,** 10 story, 70x180 ft. OFFICE, Washington St. and Wacker Dr., CHICAGO, ILL. McCormick Willoughby Co., 77 W. Washington St., Chicago 2, Ill. CD 3/20/61.

MISSISSIPPI TO ROCKIES

BUILDINGS—BA

▲ **Minn., Bloomington (P.O. Minneapolis)**—BA 6/13—Bd. Educ. Independent School Dist. No. 271, 3 story Penn JUNIOR HIGH SCHOOL, 8400 Penn Ave. S. $3,000,000. Armstrong & Schlichting, 4901 Olson Memorial Hy., Minneapolis, archts. K. M. Clark, 2815 Wayzata Blvd., Minneapolis, engr. CD 11/4/60.

BUILDINGS—SLC

▲ **Tex., Fort Worth**—Harris Hospital, 1300 W. Cannon St., soon lets contract 4 story, bsmnt., concrete frame, masonry, air-conditioned MATERNITY HOSPITAL, $5,000,000. Preston M. Geren, 1607 Fort Worth Natl. Bldg., archt. CD 4/21/61.

▲ **Tex., San Antonio**—Morris Kallison, 124 S. Flores St., soon lets contract 10 story, OFFICE, Cypress St., between Main Ave. and N. McCullough Ave., $2,000,000; parking garage, $250,000. Atlee B. & Rob. M.

(Continued on page 65)

The world-wide respect and demand for this original Miller gas engine driven welder/power plant has never been greater. To this established popularity has now been added the convenience of Bendix drive electric starting as optional equipment on models AEA-200-L and AEA-200. Model illustrated and headlined is AEA-200-LE.

As a welder, as a power plant, as a pipe thawer, indeed, as a top hand from Canadian uranium mines to Brazilian cattle ranches — and on highway construction jobs and repair ships between — the AEA-200-L stands quite alone as "the finest in the field." In addition to optional electric starter, road trailers and rubber tired running gear are also available.

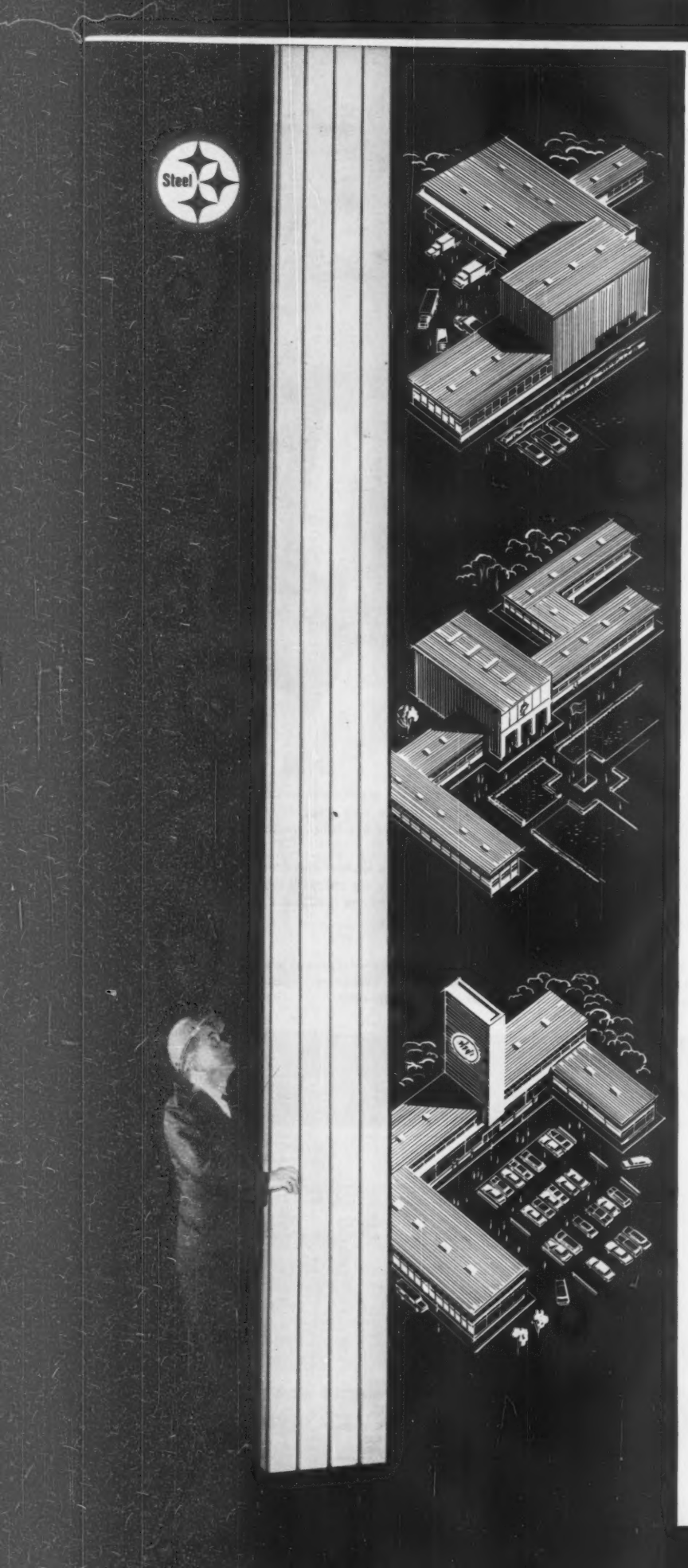
Other Miller gas engine driven DC and AC-DC welder/power plants to 300 amperes at 100% duty cycle. Full particulars will be sent promptly upon request, or a demonstration can be arranged at your convenience.

miller ELECTRIC MANUFACTURING COMPANY, INC., APPLETON, WISCONSIN
EXPORT OFFICE: 250 West 57th St., New York 19, N.Y. • Distributed in Canada by Canadian Liquid Air Co., Ltd., Montreal

PNEUMATIC CONCRETE CONTRACTORS
specialists in
BUILDING AND REPAIRING CONCRETE CONSTRUCTION
call us for information and bids:

PRE-STRESSED TANKS	STEEL ENCASEMENT
RESERVOIR LININGS	REFRACTORY LININGS
PRESSURE GROUTING	CONCRETE REPAIRS
PRECIPITATOR LINING	STACK & BUNKER LININGS

PPCR
PENNSYLVANIA PNEUMATIC CONCRETE & REFRACTORIES, INC.
1520 Walnut St., P.O. Box 55, Allentown, Pa.
Area Code 215 HEmlock 3-4168



NOW!
GET STEEL ROOF DECK IN LENGTHS UP TO 50 FEET

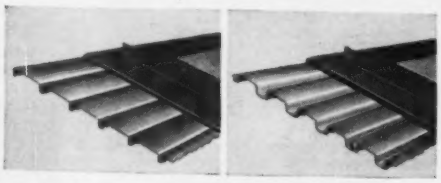
Here's good news for roof deck users! Wheeling's Super-Rib Steel Roof Deck now comes in any length . . . as long as a common carrier can handle it.

CUTS INSTALLATION COSTS! These extra-long lengths mean fewer end laps . . . fewer sheets to handle. And — because Wheeling's new design is so strong — you can now use Wheeling Super-Rib Roof Deck on continuous spans up to 12'-0".

SPECIAL PROTECTIVE COATING! Wheeling's new, improved steel roof decks have outstanding protection against weather, both during and after installation. First, they're Bonderized*; then they're *extra-protected* with a specially developed, roller-coated, baked-on gray vinyl primer!

Get the complete facts on both types of Wheeling Super-Rib Roof Deck . . . and the other fine Wheeling Products shown on the next page . . . from your Wheeling man this week. Or write Wheeling Corrugating Company, Wheeling, West Virginia.

CHOOSE FROM TWO TYPES!



Type "A" has narrow ¾" rib openings for greater adhesive contact . . . use with all types of insulation.

Type "B" has wide 2⅜" rib openings for higher carrying capacity . . . use over longer continuous spans.

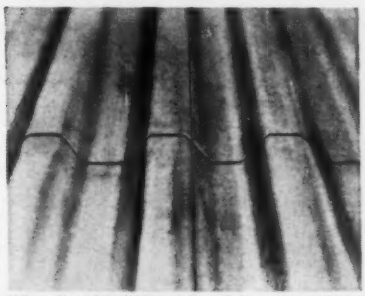
Wheeling

WHEELING CORRUGATING COMPANY
IT'S WHEELING STEEL! Warehouses: *Boston, Buffalo, Chicago, Columbus, Detroit, Kansas City, Louisville, Martins Ferry, Minneapolis, New York, Philadelphia, Richmond, St. Louis.* Sales Offices: *Atlanta, Houston, New Orleans.*

*Registered Trademark of Parker Rust Proof Company

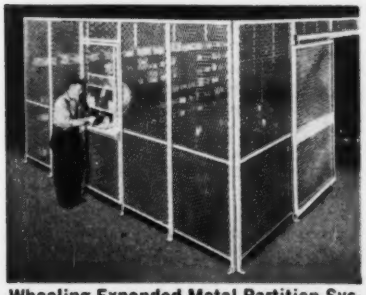
OTHER WHEELING PRODUCTS

Wheeling Continuous Weld Steel Pipe gives strong, dependable, low-cost service...usually outlasts the building itself.



Wheeling Tensilform®, with conventional or light aggregate concrete, gives structures excellent lateral stability.

Wheeling SofTite® Cop-R-Loy® Galvanized Steel Sheets, for heating and air-conditioning ducts, will not flake or peel under rough use.



Wheeling Expanded Metal Partition Systems prevent pilferage... yet allow free passage of light, heat, air and moisture.

(Continued from page 63)

Ayres, 342 W. Woodlawn Ave., archts. Reynolds & Morgan, 1003 Insurance Bldg., and Martin E. Staley, No. 31, Chandler Bldg., engrs. CD 5/2/61.

HEAVY CONSTRUCTION—LB & CA

▲ **Brown & Root, Inc.,** P.O. Box 3, Houston, Tex., LB **$1,653,766,** est. $1,440,000, UNDERPASSES, on Main and Fannin Sts., at Holcombe Blvd., HOUSTON, TEX. City, Dpt. P. Wks., City Hall, Houston, Tex. BA 5/10/61. CD 7/10/59.

▲† **M. T. Reed Constr. Co.,** 162 Millsaps Ave., Jackson, Miss., and **Boyd Constr. Co.,** P.O. Box 822, Grenada, Miss., LB **$3,749,570,** (10 bidders), Two Rivers RESERVOIR PROJ., Rio Hondo, Roswell, Chaves Co., ENG-29-005-61-9B, NEW MEXICO. U. S. Eng., P.O. Box 1538, Albuquerque, N. M. BA 5/9/61. CD 4/28/61.

BUILDINGS—LB & CA

▲ **Kraus-Anderson, Inc.,** 501 S. 8 St., Minneapolis, Minn., CA Est. **$2,000,000,** 165x200 ft. DEPARTMENT STORE, tract adjoining Brookdale Shopping Center, Hy. 100, Shingle Creek, 59 Ave. and Osseo Rd., BROOKLYN CENTER (MINNEAPOLIS P.O.), MINN. Sears, Roebuck & Co., 925 S. Holman Ave., Chicago, Ill. BA 4/13. CD 4/5/61.

▲ **Seminole Constr. Co.,** Osceola, Ark., Owner Builds, **$4,000,000,** 200 HOUSES, subdivision on State Hy. 140, OSCEOLA, ARK.

▲ **Owner,** c/o Jack Rich, 506 E. Broadway, West Memphis, Ark., Owner Builds, **$5,000,000,** 412 HOUSES, Holiday Gardens subdivision on Interstate Hy. 55, WEST MEMPHIS, ARK.

▲ **Mayers-Sanders,** 3407 San Fernando Rd., Los Angeles, Calif., CA **$4,386,000,** No. 2, 1,044 units ARMED SERVICE CAPEHART HOUSING, GRAND FORKS, N. D. Base Procurement Office, Grand Forks Air Force Base, Grand Forks, N. D. CD 5/8/61, under LB.

FAR WEST

HEAVY CONSTRUCTION—BA

▲† **Calif., Long Beach**—BA 6/16—11th Naval Dist. P. Wks., 1220 Pacific Hy., San Diego, Zone 1, SUBSIDENCE REMEDIAL MEASURES, Increment No. 5, raise Pier 2, constr. quay wall, etc., Long Beach Naval Shipyard, Spec. 37887 $1,000,000-$2,500,000. CD 9/25/59.

▲ **Calif., Los Angeles**—BA 6/16—Los Angeles County Flood Control Dist., 2250 Alcazar St., Proj. 59, Unit 2, Central Business District STORM DRAIN. $2,500,000. CD 11/10/58.

HEAVY CONSTRUCTION—LB & CA

▲ **Howard P. Foley Co.,** 501 W 1st St., N. Salt Lake City, Utah, and **Jelco, Inc.,** 1919 WN Temple St., Salt Lake City, Utah, CA **$17,481,077,** 300 mi. 345,000 volt TRANSMISSION LINE, from Phoenix, Ariz. to Four Corners Power plant in New Mexico, ARIZONA-NEW MEXICO. Arizona Public Service Co., 50 S. 3 Ave., Phoenix, Ariz. CD 2/8/57.

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles, Bids opened 5/11, ROAD.

B. J. Ukropina, Polich-Kral & Ukropina, P.O. Box 105, San Gabriel, Calif., LB **$3,861,104,** (4 bidders), grading, paving 2.4 mi. six and eight lane freeway on Golden State Freeway between 0.1 mi. west of Lankershim Blvd. and Osborne St. in Los Angeles, incl. 15 structures, Los Angeles Co. CD 4/5/61.

BUILDINGS—LB & CA

▲† **Nomellini Constr. Co. & F. P. Lathrop Constr. Co.,** 939 Marengo Rd., Stockton, Calif., CA **$4,949,000,** completion CAPEHART HOUSING, No. 2, BEALE AIR FORCE BASE, CALIF. Base Procurement Office, Beale Air Force Base, Calif. CD 4/21/61, under LB.

▲ **Pearl Harbor Heights Developers,** P.O. Box 455, Aiea, Oahu, Hawaii, Owner Builds, **$3,469,000,** (5 to 10 years to complete), Unit 11, 141 HOMES, streets, roads, imprvs., grading, levelling, Enchanted Hills Estate, AIEA, HAWAII. Hawaiian Pacific Industries 914 Ala Moana Blvd., Honolulu, Hawaii, archts. W. K. Collins, Hawaiian Life Bdg., Kapiolani Blvd. Honolulu, Hawaii, engr.

▲ **Pearl Harbor Heights Developers,** P.O. Box 455, Aiea, Oahu, Hawaii, Owner Builds, **$4,208,390,** (5 to 10 years to complete), Unit 1, 238 HOMES, grading, levelling streets, roads, Imprvs. Halawa Heights Estates, AIEA, HAWAII. Geo. Barrett (Hawaiian Pacific Industries), 914 Ala Moana Blvd., Honolulu, Hawaii, archt. Fred Pack Assocs., 931 University Ave., Honolulu, Hawaii, engrs.

CANADA

BUILDINGS—BA

▲ **Ont., Ottawa**—BA 5/31—The Royal Trust Co., 128 Wellington St., OFFICE, Albert and Metcalfe Sts. $2,000,000. Belcourt & Blair, J. W. Strutt, Auguste Martineau, Helmer & Morin, 30 The Driveway, Ottawa, archts. CD 4/11/61.

▲ **Ont., Toronto**—BA 6/1—Central Mortgage & Housing Corp., 650 Lawrence Ave. W., low rental 2 story HOUSING UNITS, 6 story APARTMENT, Scarlett Rd. $2,000,000. Plans deposit $100. Bregman & Hamann, 146 Bloor St. W., Toronto, archt for apartment. CD 11/18/60.

BUILDINGS—SLC

▲ **Labrador, Carol Lake**—Iron Ore Co. of Canada, 810 Cote de Liesse Rd., Montreal, Que., soon lets contract

POSEY

AUTOCLAVES

Our capabilities include pressure vessels of all types, such as special vulcanizers and autoclaves. Engineering service available.

For FREE 16-page illustrated catalog on Industrial Heating applications, write:

Custom Fabrication For Over 50 Years

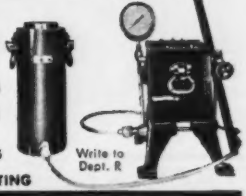
DIVISIONS:
• Iroquois Asphalt Plants • Mixers and Blenders
• Tunnel Forms • Industrial Heating • Foundry
• Large OD Steel pipe

561 S. PRINCE STREET LANCASTER, PA.

DUDGEON HYDRAULIC JACKS

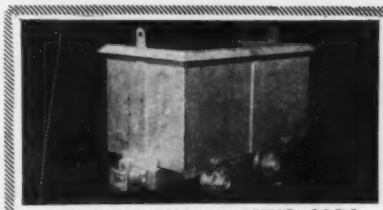
SALES RENTALS
• CAPACITY TO 600 TONS

FOR:
PILE TESTING
•
UNDER-PINNING
•
BRIDGES
•
PIPE PUSHING
•
SOIL TESTING



Write to Dept. R

RICHARD DUDGEON INC.
789 BERGEN ST. • ST 9-4040 • BROOKLYN, N. Y.



PRACTICAL, RUGGED MINE CARS
Side Dump and Rocker Dump cars, 24" gage. Tunnel cars, 18" and 24" gage. Various capacities. Ask for Bulletin No. 18.

MAYO
TUNNEL AND MINE EQUIPMENT
Lancaster, Penna.

EFCO Steel Forms
available with
RETURN OPTION

Satisfaction is guaranteed when you purchase EFCO Lifetime Steel Forms for your concrete forming needs.

NEW CATALOG

Describes and illustrates EFCO Steel Forms and accessories with examples of many uses. Send coupon for your copy.

EFCO ECONOMY FORMS

MAIL TODAY

Economy Forms Corp.
Box 128-A, H. P. Station
Des Moines, Iowa

Please send new catalog on EFCO Steel Forms, and address of nearest sales office (there are 29 coast to coast).

Name_____

Firm name_____

Address_____

City_____ State_____

81 HYDRAULIC JACKS & PULLERS
to choose from

Self-Contained **STANDARD JACKS** 1½ to 100 tons capacity.
WRITE FOR CAT. H-60

Self-Contained **CENTER-HOLE PULLERS** 30 to 100 tons capacity.

SIMPLEX RE-MO-TROL UTIL-A-TOOL JACKS JENNY SOL-TOE

TEMPLETON, KENLY & CO.
2553 Gardner Road
Broadview, Illinois

ALWAYS USE POSTAL ZONE NUMBERS

Without the zone number addresses are incomplete in 106 U. S. cities.

CONCENTRATING MILL, part of iron ore beneficiating plant, Carol Lake Mining Development. $6,000,000. Canadian Bechtel Ltd., 5595 Pare St., Montreal, Que., engrs. CD 4/27/61.

▲ **Ont., Smiths Falls**—The Hershey Chocolate Corp., 19 E. Chocolate Ave., Hershey, Pa., U. S. A., soon lets contract, structural steel for CHOCOLATE PLANT, Lorne St. E., $7,000,000. Day & Zimmerman, 1700 Sansom St., Phila., Pa., U. S. A., project managers. Surveyor, Nenniger & Chenevert 1440 St. Catherine St. W., Montreal, Que., assocs engrs. CD 2/6/61.

BUILDINGS—LB & CA

▲ **Anglin-Norcross Western Ltd.,** 1157 Melville St., Vancouver, B. C., CA $1,836,602, 3 story, concrete frame Eric Hamber SECONDARY SCHOOL, Incl. one double gymnasium, auditorium, cafeteria, library, administration offices, etc. Oak and 33rd St., VANCOUVER, B. C. Vancouver School Dist. No. 39, 1595 W. 10th St., Vancouver, B. C. BA 4/26/61, CA 5/8/61. CD 5/10/61, under LB.

▲ **Anglin Norcross Maritime Ltd.,** 892 Sherbrooke St., Montreal, Que., CA Total est. $4,000,000, 400,000 sq. ft. rein.-con. frame SHOPPING CENTER, Bayers and Mumford Rd., HALIFAX, N. S. Webb & Knapp (Canada) Ltd., 1010 St. Catherine St. W., Montreal, Que. BA 3/29/61. CD 3/22/61.

▲ **Leopold Sipolins,** 90 Juliana Rd., Toronto, Ont., Owner Builds, $5,000,000, APARTMENTS, DUPLEXES, Subdivision, Carling Ave. and Ottawa River (Britannia Park), OTTAWA, ONT.

▲ **Newman Bros. Ltd.,** 4A Clark St., Box 608, St. Catharines, Ont., CA $2,630,810, 6 story, rein.-con., frame, masonry, brick HOSPITAL WING, ST. CATHARINES, ONT. St. Catharines General Hospital, Bd. Governors, St. Catharines, Ont. BA 4/27/61. CD 4/14/61.

▲ **Anglin-Norcross Ontario Ltd.,** 224 Davenport Rd., Toronto, Ont., and **General Property & Investments Ltd.,** London, England, Owners Build, $10,000,000. 400,000 sq. ft. SHOPPING CENTRE, Incl. precast screening, curtain wall constr., steel framing main bldg., glass panelling, stainless steel blades between panels circular bldg. Over Davisville subway yards, TORONTO, ONT. C. D. Carruthers & Wallace Consultants Ltd., 92 Yorkville St., Toronto, Ont., superstructure engrs. De Leuw Cather & Co. of Canada, 1491 Yonge St., Toronto, Ont., substructure engrs.

▲ **Carlington Investments Ltd.,** c/o Harry B. Kohl, archt., 491 Lawrence Ave. West, Toronto, Ont., Owner Builds, $2,500,000, two 7 and 15 story APARTMENTS, Wedgewood Dr. and Torbruk Crescent, TORONTO, ONT.

AMERICANS ABROAD

BUILDINGS—LB & CA

▲ **Westinghouse International Corp.,** 40 Wall St., New York, N. Y., U.S.A., CA Est. $3,000,000, ELECTRICAL EQUIPMENT for Steel Rolling Mill, AVILES, SPAIN. Empresa Nacional Siderugica S.A., Madrid, Spain.

▲ **Fluor-Schuytvliet N. V., subsidiary Fluor Corp., Ltd.** 25000 S. Atlantic Blvd., Los Angeles 22, Calif., U.S.A., CA Est. $2,000,000, GAS PURIFICATION and SULFUR RECOVERY PLANT near Dueste, WEST GERMANY. Wintershall A.G., c/o contractor.

LATIN AMERICA

HEAVY CONSTRUCTION—LB & CA

▲ **ARGENTINA**—National Hy., Dpt. of Argentine Republic, Avenida Maipu, Buenos Aires, Bids opened 4/28, ROADS,

Argentina—**Perales Aguiar S.A., Polledo S.A.,** Venezuela 925, Buenos Aires, Argentina, LB $6,173,062, est. $5,769,591, Group 1, 167.8 kims. bit. tarred hy. Rte. 18 and Rte. 14, incl. reconditioning of basis works Entre Rios Province, Parana-Villaguay A. Sandoval-S. Salvador;

Argentina—**Cedosa, Can Martin,** 575, Buenos Aires, Argentina, LB $4,504,470, est. $4,283,969, Group 2, 101.7 kims. bit. tarred hy. Rte. 126, Entre Rios Province, junction R. 127-La Paz.La Paz-Arroyo Hondo. CD 3/14/61.

FOREIGN

▲ **Australia**—Bids Asked—Reserve Bank of Australia, Establishment Dpt., Head Office, Box 3947, G.P.O., Sydney, New South Wales, 21 story, 3 bsmnt. OFFICE, Martin Pl., Phillip St. and MacQuade St. $9,000,000. Firms interested should register by May 22, 1961.

HEAVY CONSTRUCTION—LB & CA

ENGLAND—Ministry of Transport, London, ROAD, **Tarmac Civil Engineering, Ltd.,** Ettingshall, Wolverhampton, England, CA Est. $24,080,000, 15 mi. Birmingham-Preston Motorway with 36 bridges. Scott & Wilson, Kirkpatrick & Partners, 47 Victoria St., London, engrs., for bridges.

PROPOSED PROJECTS

SEWERS, WASTE DISPOSAL

▲ **Conn., Poquonnock Bridge (Br. New London)**—Town of Groton, Town Hall, SEWAGE TREATMENT PLANT and SEWERS, Poquonnock Bridge and Long Hill. $2,778,400. Hayden, Harding & Buchanan, 1340 Soldiers Field Rd., Boston, Mass., consult. engrs. CD 6/10/60.

▲ **Mo., St. Joseph**—City, City Hall, $3,360,000 bond election June 20, MAIN SEWERS and EXTENSIONS. Black & Veatch, 1500 Meadow Lake Parkway, and P. O. Box 8405, Kansas City 14, Mo., consult. engrs. CD 4/19/61.

▲ **N. J., New Market**—Piscataway Twp. Sewerage Auth., Municipal Bldg., SEWERAGE SYSTEM, Piscataway. $4,200,000. C. J. Kupper, 15 Stelton Rd., consult. engr. CD 12/16/59.

STREETS AND ROADS

▲ **Mo., Webster Groves (St. Louis 19 P.O.)**—City, City Hall, 4 E. Lockwood Ave., defeated $2,000,000 bonds May 2, REPAVING, etc., various arterial streets and avenues; defeated $500,000 bonds May 2, REPAIRS residential streets. CD 3/2/61.

EARTHWORK, WATERWAYS

▲ **California**—Bd. Supervs. Placer Co. Water Agency, County Courthouse, Auburn, bond election June 20, WATER POWER PROJ., Upper Middle Fork, Placer Co. $140,000,000.

▲ **Calif., San Luis Obispo**—San Luis Obispo County Flood Control & Water Conservation Dist., Court House, WATER TRANSMISSION LINE from Nacimiento Reservoir to San Miguel, Pasco Robles, Templeton, Atascadero, Santa Margaritea and San Luis Obispo with DAM and RESERVOIR at Pasco Robles Creek. $8,000,000. Leeds Hill & Jewett, 609 S. Grand Ave., Los Angeles, Zone 17, engrs. Bids Spring 1963. CD 5/5/61.

UNCLASSIFIED

▲ **Calif., San Francisco**—San Francisco Port Auth., Ferry Bldg., revising plans dredging, sand and rock facing, seawall for PORT TERMINAL PROJ. $30,000,000. John A. Blume & Assoc., 612 Howard St., San Francisco, Calif., consult. engrs. CD 1/4/61, under LB.

▲† **Va., Portsmouth**—P. Wks. Office, Fifth Naval Dist., Norfolk, Zone 11, plans by Hayes, Seay, Mattern & Mattern (A & E), 1615 Franklin Rd. S.W., Roanoke, IMPRV. WATERFRONT UTILITIES and FACILITIES for Submarine Repair work. $3,000,000. CD 7/29/60.

PUBLIC BUILDINGS

▲ **Ala., Mobile**—Mobile County Bd. Educ., 504 Government St., plans by Platt Roberts & Co., 1010 Merchants National Bank Bldg., 178,000 sq. ft. W. P. Davidson HIGH SCHOOL, Azalea Rd. $3,000,000. Hamlin & Duepree, 55½ N. Royal St., consult. engrs.

▲ **Ala., Mobile**—Mobile Infirmary, Louiselle St., plans by Platt Roberts & Co., 1010 Merchants National Bank Bldg., 6 story, 120,000 sq. ft., HOSPITAL ADDN. $3,400,000. Ewin, Campbell & Gottlef, 50 Macon St., struct. engrs. Hamilin & Duepree, 55½ N. Royal, mech. engrs.

▲ **Calif., Los Angeles**—Bd. Regents, University of California, 405 Hilgard Ave., plans by Welton Becket & Assocs., 10,000 Santa Monica Blvd., 4 story top MEDICAL CENTER ADDN. $10,000,000. Constr. 1962.

▲ **Fla., Miami**—Miami Housing Auth., 327 N.W. 62 St., plans by Smith & Korach, 721 N.W. 21st Court, two 10 story APARTMENTS, N.W. 7th St. and 14th Court. $2,000,000. Bids Fall 1961.

▲ **Ill., Belleville**—Belleville Township High School and Junior College Dist. 201, 2600 W. High St., plans by Hellmuth, Obata & Kassabaum, Inc., 315N. 10th St., St. Louis 1, Mo., and Weisenstein, Rogers & Hausmann, 3201 W. Main St., archts., brick, concrete, steel HIGH SCHOOL. $3,500,000. CD 10/2/58.

▲ **Ill., Joliet**—Joliet Twp. High School Dist., 201 E. Jefferson St., bond election May 27, two HIGH SCHOOLS, East Side and West Side. $6,800,000. CD 21/23/54.

▲ **Ill., Chicago**—University of Illinois, Urbana, plans by Richardson, Severens & Scheeler, Champaign, and Shaw, Metz & Assocs., 208 South La Salle St., Zone 4, first phase MEDICAL SCIENCES BLDG., Wolcott near Polk. $3,580,000. Bids in Summer.

▲ **Ind., Indianapolis**—Trustees, The Health & Hospital Corp. of Marion Co., 730 E. Washington St., plans by McGuire, Shook, Compton & Richley, I.S.T.A. Center, (first phase) GENERAL HOSPITAL ADDN., $12,000,000, Constr. 1962; (second phase) renovating present buildings, outpatient bldg., $5,000,000. Bevington Taggart & Fowler, K of P Bldg., consult. engrs. CD 2/19/48.

▲† **Md. Poolesville**—General Services Admin., 19th and F Sts. N.W., Wash., D. C., plans by Hayes, Seay, Mattern & Mattern, 1707 H St., N.W., Wash., D.C., KENNEL, FARM ANIMAL, utility structures and staff quarters, Animal Farm for National Institutes of Health, 1st Phase. $2,800,000. Total est. $11,000,000.

▲ **Mass., Leominster**—City, Supt. Schools, plans by L. W. Briggs & Assoc., Inc., 90 Park Ave., Worcester, HIGH SCHOOL, Granite St. $3,479,000. CD 10/22/59.

▲ **N. J., Freehold**—Freehold Regional High School Dist., Broadway, referendum bonds and project June 15, HIGH SCHOOL, Yellow Brook Rd., Howell Twp. $3,400,000. Micklewright & Mountford, East Stuyvesant, Trenton, archts. CD 4/5/61.

▲ **N. Y., Plainedge**—Plainedge Unif. School Dist. No. 18, Hicksville-Massapequa Rd., Bethpage, defeated

(Continued on page 69)

Lead provides critical radiation shielding at Indian Point

At Con Edison's $100-million nuclear power station, lead is specified for attenuation of gamma-radiation intensities in two areas where space and weight considerations are of prime importance.

Lead shot fills 22 feet of the annulus between the outer steel pipe and inner transfer tube which carries highly radioactive spent fuel elements from reactor to storage for cooling. The 92 tons of lead shot were simply poured in, obviating the need for specially fabricated shield components.

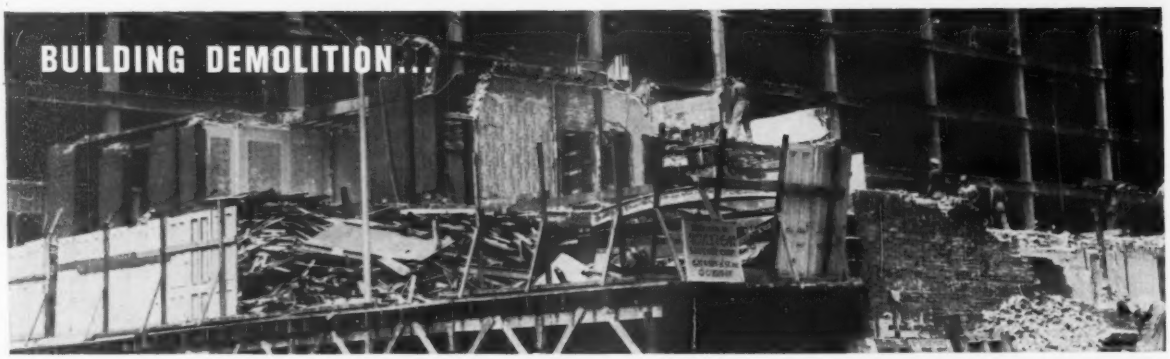
Lead brick, with lead shot filling the interstices, lines the door, set in a lead-filled steel frame, between fuel-handling building and reactor compartment. Only twelve inches thick, the door provides gamma-ray shielding equivalent to 5½ feet of concrete.

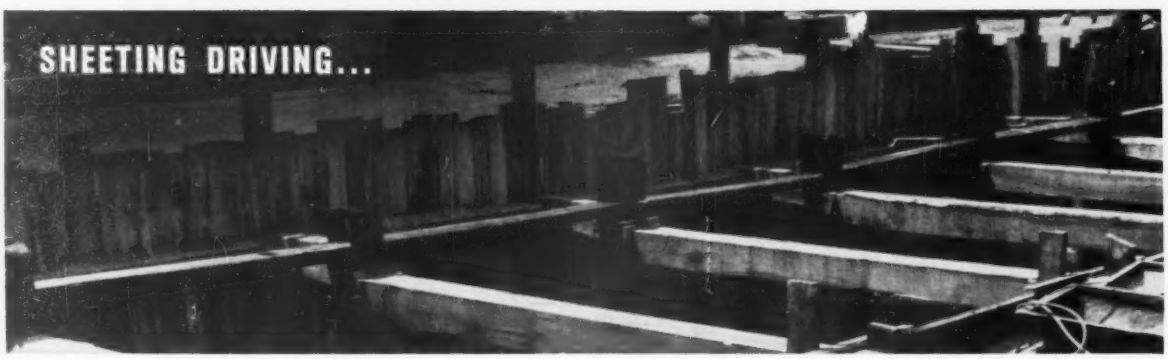
Brick and shot are just two of many forms in which lead is available to save space, weight, and construction costs while providing what the AEC has called "the best practical gamma shielding" for most applications. Other forms of lead, like sheet, extrusions, wool, castings and impregnated plastics, are convenient and effective for shielding applications.

If you have a radiation shielding problem, you can get solid help in solving it with lead by contacting Lead Industries Association, 292 Madison Ave., New York 17, New York.

4072

LOOK AHEAD WITH LEAD





CP DEMO'S HANDLE 'EM ALL!

There's a CP Demo "just-right" for every job . . . each handles smoothly and safely whether used vertically or horizontally. Where footing is bad and the going is rough, operators appreciate their hitting action and easy handling. *Chicago Pneumatic Tool Company, 8 East 44th Street, New York 17, N. Y.*

CP-124, 80 lb. Class Demo for heavy duty jobs

CP-115, 60 lb. Class Demo sets standards for horizontal work. Only 55 lbs. with spring retainer

Sheeting Drivers handle easy . . . won't broom or split sheeting

Chicago Pneumatic

PORTABLE AIR COMPRESSORS • PNEUMATIC and ELECTRIC TOOLS • REICHdrills • THREE-CONE AIR-BLAST BITS • ROCK DRILLS

(Continued from page 66)

$3,220,000 referendum May 3, JUNIOR HIGH SCHOOL, Baldwin Dr. $2,560,000. CD 4/14/61.

▲ **N. Y., Plainview**—Bd. Educ. Central School Dist. No. 4, Jamaica Ave., $4,990,000 referendum May 31, JUNIOR HIGH SCHOOL, east side Washington Ave. CD 4/17/61.

▲ **O., Akron**—City, City Hall, three deck PARKING, Bowery, Howard, Mill, Ash and Quaker Sts. $2,000,000. Matthew Rosenstock & Assocs., 834 E. Exchange St., consult. engrs. CD 12/10/59.

COMMERCIAL BUILDINGS

▲ **Calif., Los Angeles**—McCulloch Corp., c/o Welton Becket & Assocs., archts.-engrs., 10000 Santa Monica Blvd., Los Angeles, Zone 25 (1st phase), McCulloch CENTER, 12 story, 235,000 sq. ft. OFFICE, 1 story RESTAURANT, 2 level PARKING STRUCTURE, Century and Sepulveda Blvds.; (2nd phase) 11-12 story, 100 x 200 ft. OFFICE; (3rd phase) OFFICE BLDG., Century and Sepulveda Blvds., 98 St. and Vicksburg Ave., Los Angeles Airport. $20,000,000.

▲ **Calif., Oxnard**—Brighton-Bilt Homes, 265 N. Robertson Ave., Beverly Hills, plans by Wm. M. Bray, 962 N. La Cienega Blvd., Los Angeles, 595 DWELLINGS, First Stage 130 DWELLINGS 100 acre subdivision, Rose and Colonia Rds. $1,430,000. Total est. $6,545,000. Neil Cummings, Oxnard, consult. engr.

▲ **Fla., Miami**—Federated Dpt. Stores, 1700 NW 32 Ave., plans by Weed-Johnson Assocs., 550 Brickell Ave., 2 story, 130,000 sq. ft. Burdines DEPARTMENT STORE, N .Kendall Dr. and S. Dixie Hy. $2,000,000.

▲ **Fla., Oakland Park**—Real Site, Inc., 3121 NW 43rd Ave., Fort Lauderdale, SHOPPING CENTER, $4,000,000.

▲ **Fla., South Miami**—Pyms-Martin-Novack Bldg., c/o Charles E. Lackey archt, 1550 S. Dixie Hy., Coral Gables, 12 story OFFICE, SW 74th St. between 58 and 59 Ave. $3,000,000.

▲ **N. J., East Orange**—Harrison Towers Corp. of New York, 101 Park Ave., New York, N. Y., plans by Morris Lapidus Harle & Liebman, 139 East 56th St., New York, N. Y., 17 story APARTMENT, South Harrison St. $4,500,000.

▲ **N. J., East Orange**—Parkway House Inc., 1100 McCarter Hy., Newark, plans by Isadore Naftali, 312 High St., Newark, 14 story, 170-unit APARTMENT, Garden State Parkway Drive and Fourth Ave. $3,500,000. Bernard Shaw, 37 Washington Ave., Morristown, struc. engr. Emil Spina, 19 Beechwood Rd., Summit, mech. engr. Constr. Summer 1961.

▲ **N. J., Passaic**—Towers, Inc., c/o Richard Wilson Constr. Co., Inc., 100 Hugenot Ave., Englewood, plans by Isadore Naftali, 312 High St., Newark, 15 story, 135-unit APARTMENT, Passaic Ave. $3,250,000. Bernard Shaw, 37 Washington Ave., Morristown, struc. engr. Herman Scherr, 18 John St., New York 38, N. Y., mech. engr. Constr. Summer 1961.

▲ **N. J., Trenton**—S. Hekemian & Son, 477 Main St., Hackensack, 600-unit APARTMENT, Reeder Ave. off Lawrence Rd. $5,000,000.

▲ **N. Y., New York**—Benenson-Rose-Tisch, 529 Fifth Ave., Zone 17, plans by Emory Roth & Sons, 400 Park Ave., 13 story, 92 x 205 ft. OFFICE, 61-77 W. 46 St., 1180 6th Ave. $3,285,000. Alfred Kleinberger, 551 5 Ave., Zone 17, mech. engr. James Ruderman, 32 Union Square, Zone 3, struct. engr. CD 1/23/61.

▲ **N. Y., New York**—The Durst Organization, 200 E.42 St., Zone 17, plans by Emory Roth & Sons, 400 Park Ave., Zone 22, 20 story OFFICE, 757 3 Ave. and E.47 St. $5,000,000.

▲ **N. Y., New York**—Herbert Fischbach, 545 Madison Ave., Zone 22, plans by Emery Roth & Sons, 400 Park Ave., Zone 22, 18 story OFFICE, 771-81 3 Ave. and 205-07 E. 48 St. $3,500,000. Owner changed. CD 12/14/60, under Syndicate, c/o J. E. Saltzman, as owner.

▲ **N. Y., New York**—George B. Rabinor, 158 Irving Pl., Woodmere, plans by Oscar Silverstone, 666 5 Ave., Zone 19, 10 story, 160 unit Elder Terrace APARTMENT, 1.25 acres, east side Elder Ave., north of Bruckner Blvd., Bronx Boro. $3,022,000. Mayer Assocs., 110 E. 30 St., Zone 16, mech. engrs. Robert Rosenwasser, 375 Fifth Ave., Zone 16, struct. engr. Constr. Fall 1961. CD 3/29/61.

▲ **N. Y., New York**—Abraham Sommer, P.O. Box 188, Iselin, N. J., plans by Emory Roth & Sons, 400 Park Ave., 23 story, 200 x 290 ft. 135 W. 50 St. OFFICE, 134-146 W. 51 St. $8,400,000. Sidney Barbanel, 29-46 Northern Blvd., Long Island City, mech. engr. James Ruderman, 32 Union Square, Zone 3, struct. engr. CD 1/23/61.

▲ **O., Columbus**—Owner, c/o Seidel & Dunn, archts., 1738 W. 5th Ave., 6 story OFFICE, southwest corner Broad and 5th Sts. $2,000,000.

▲ **O., Rocky River**—Owner, c/o Lloyd Pelrman, 14550 Lorain Ave., Cleveland, Zone 11, plans by R. M. Hovanetz, 3119 W. 139th St., Cleveland, Zone 11, 190 suite luxury APARTMENT, Wooster Rd. and Shoreland Dr. $2,680,000.

▲ **Pa., Pittsburgh**—Lewis E. Kitchen, City Natl. Bank Bldg., Kansas City, Mo. and Aluminum Co. of America, Alcoa Bldg., Pittsburgh, plans by Deeter & Richey, 3 Gateway Center, Pittsburgh, 13 acre SHOPPING PLAZA, with underground garage, 1,400 DWELLING UNIT town houses and apartments, Stockton, Union, Montgomery and Sherman Aves. $50,000,000.

▲ **Tenn., Knoxville**—Morgan Schubert, 4000 Washington Ave., 300 RESIDENCES, $4,200,000.

▲ **Tex., Houston**—H & A Building Co., 918 Bay Oak St., 90 DWELLINGS in Bay area, $2,200,000.

▲ **Tex., Houston**—Old Market Corp., A. S. Koehler, (representative) 3611 Ella Lee Lane, multi-story MOTEL, $2,750,000; PARKING GARAGE, $500,000, Preston, Travis, Congress, Milam Sts.

▲ **Va. South Norfolk**—Philo Corp., c/o S. L. Nusbaum & Co., Maritime Tower, Norfolk, plans by Oliver & Smith, 333 West Freemason St., Norfolk, Downtown Plaza SHOPPING CENTER, stores, 100,000 sq. ft. office, parking for 1,000 cars, on 19 acre tract. $5,000,000.

▲ **Wash., Bellevue**—Crossroads, Inc., c/o J. Woodman & Assocs., archts., 14217 Lake Hills Blvd., 430,000 sq. ft. SHOPPING CENTER, GOLF COURSE, 562 unit COURT TYPE APARTMENTS. $11,000,000. Constr. this year on 100,000 sq. ft. unit shopping center.

▲ **Wis., Milwaukee**—Milwaukee School of Engineering, 1025 N. Milwaukee St., Zone 2, ENGINEERING and METAL LABORATORY, $1,000,000; 3 DORMITORIES, $4,500,000; STUDENT UNION, $500,000. Chas. Nagel & Assocs., 1615 Underwood Ave., Wauwatosa, Zone 3, consult. engrs.

INDUSTRIAL BUILDINGS

▲ **California**—Pacific Gas & Electric Co., 245 Market St., San Francisco, Zone 6, 660,000 kw. unit to double Contra Coast POWER PLANT, near Antioch, Contra Costa Co. $73,000,000. To go ahead 1962.

▲ **Del., Delaware City**—Tidewater Oil Co., 79 New Montgomery St., San Francisco, Calif., PLANT to produce Oxo Alcohol, adjacent to refinery, Air Products, Inc., Trexlertown, Pa., consult. engrs.

▲ **N. J., Pennsauken**—Central Airport, Inc., 383 Madison Ave., New York, 17, N. Y., plans by John B. Barry, 383 Madison Ave., New York, 13, N. Y., INDUSTRIAL PARK on 150 acres. Approx. $10,000,000.

▲ **N. Y., Westbury**—Engineers Hill Industrial Park, 467 Great Neck Rd., Great Neck, plans by Irving Hirshman, 280 Northern Blvd., Great Neck, Engineers Hill INDUSTRIAL PARK, incl. multi-story OFFICE, 4.2 acres, Brush Hollow Rd. between Jericho Turnpike and Northern State Parkway. Over $2,000,000.

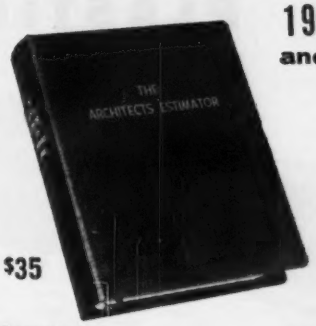
▲ **Wash., Tacoma**—Dominion Tar & Chemical Co., Ltd., Sun Life Bldg., Montreal, Que., LIME PLANT. $2,000,000.

FOREIGN

▲ **India**—Govt. India, New Delhi, Stage II Sharavathi Hydro-electric POWER PLANT, incl. 445,000 kw. generator, raising dam to 188 ft., power house addn., 5 generators, transmission line and substation in State of Mysore. $21,500,000 development fund loan.

What will it cost?

CHECK YOUR BUILDING PROJECT with reliable JOB COSTING figures



$35

1961 ARCHITECTS ESTIMATOR
and COST REFERENCE GUIDE

Supplies accurate preliminary unit building costs in convenient form. Here are all the important facts and figures on current unit costs for every construction job large or small from excavation to final sub-contractor. All costs in this invaluable book include mark-up, overhead and profit. Regarded by architects, engineers, contractors and subs in the building industry as the most comprehensive guide to normal profitable operation. Valued highly by industry and government in planning construction projects. Special section devoted to foreign building costs. Revised yearly, new edition just published.

The most complete construction cost Reference Guide ever compiled.

PROFESSIONAL CONSTRUCTION ESTIMATOR
A Labor & Material Calculator

$15

Gives the time it takes labor to complete each unit of work on any construction project. An essential aid to your operation. A companion book to the "ARCHITECTS ESTIMATOR".

Both compiled by the foremost professional estimator, Jacques Ing Cramer Priest

SAVE 10%—order both books for $45.00

ORDER TODAY BY MAIL

RESEARCH PUBLISHING CO., Dept. EN
P.O. Box 42004, Los Angeles 42, Calif.

Send ____ copies of ARCHITECTS ESTIMATOR @ $35.00 each;
____ copies of PROFESSIONAL CONSTRUCTION ESTIMATOR @ $15.00 each. (In Calif. add 4% Sales Tax)

Enclosed is ☐ Check ☐ Money Order

NAME _____

ADDRESS _____

CITY _____ ZONE ____ STATE _____

END WORRY ABOUT WATER

MORETRENCH WELLPOINT SYSTEM
Guarantees Dry Digging
Send for Catalog
MORETRENCH CORPORATION
World's Oldest, Largest and Most Experienced Predrainage Organization
Main Office & Plant: Rockaway, N. J.
Chicago, Ill., Tampa, Fla., Houston, Tex., Hackensack, N. J.

CUT FORMING COSTS

. . . . with the Versatile

SUPERIOR COIL TIE SYSTEM

NOW Featuring the

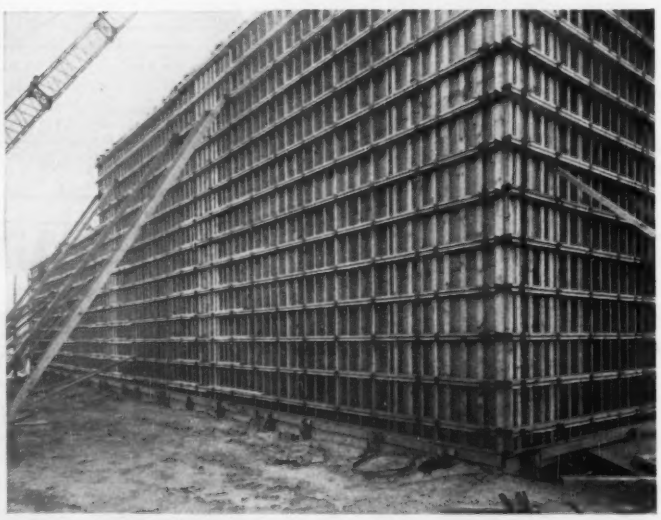
NEW "BOND-FREE" PLASTIC COIL CONE

Cannot adhere to concrete! Instant cone removal. Made of tough plastic designed for long life. Distinctive red color. Smaller cone—O.D. only 1¼".

The various types of ties, working parts, and tools which comprise the modern SUPERIOR Coil Tie System provide the speediest, safest, most versatile concrete forming method available today! Any form, no matter how complex or unexpected its nature, can be economically tied using one or more of the SUPERIOR Coil devices. Form erection crews can maintain fast schedules because simplicity and adaptability are built-in. Only the coil tie is expendable . . . all working parts are returnable for credit. The Cone-Fast Coil Tie now features the plastic "Bond-Free" Coil Cone which threads onto the extended coil of the coil tie as shown above. Cones cannot be knocked off and units can be bench assembled, if desired.

The versatility of this system is shown in a new 6 page bulletin, now available . . .

Request a copy of BULLETIN CTS-1



SUPERIOR Concrete Accessories, Inc.

9301 King St., Franklin Park, Ill. *(A Suburb of Chicago)*

New York Office
39-01 Main St., Flushing 54, N. Y.

Houston Office
4101 San Jacinto, Houston 4, Tex.

Pacific Coast Office and Plant
2100 Williams St., San Leandro, Calif.

Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

HEAVY CONSTRUCTION—LB & CA

▲† **Perini Contr. Corp.**, 73 Mt. Wayte Ave., Framingham, Mass., CA **$2,349,260**, DAM and APPURTENANCES, Mad River Dam and Reservoir, CONNECTICUT. U. S. Eng., 424 Trapelo Rd., Waltham, Mass. BA 5/3/61. CD 5/8/61, under LB.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

▲† **Pa., Phila.**—BA 6/1—U. S. Eng., 24th and Maryland Ave., Baltimore, Md., Frankford Arsenal-ELECTRICAL DISTRIBUTION SYSTEM, ENG-18-020-61-26. $2,500,000. Albert C. Wood Associates, Inc., 1812 Arch St., Phila., engr. CD 5/4/61.

BUILDINGS—BA

▲ **Pa., Burgettstown**—BA 6/29—Burgettstown Area Merged School Dist., SECONDARY SCHOOL, $2,500,000. A. E. Tennyson, 666 Washington Rd. Mt. Lebanon, Zone 28, archt. CD 10/15/59.

▲ **N. J., Linden**—Bids Asked—General Aniline & Film Corp., 111 West 50th St., New York, N.Y., CHLORINE CAUSTIC SODA PLANT ADDN., waterfront. $3,000,000. Rodney Wich, c/o owner, ch. engr.

BUILDINGS—SLC

▲ **Pa., Media**—Riddle Memorial Hospital, 5 W. Front St., soon lets contract Riddle MEMORIAL HOSPITAL. $2,500,000. Lawrie & Green, 321 N. Front St., Harrisburg, archts. Edgar T. Clapp, 1930 N. 2nd St., Harrisburg, engr. CD 4/20/61.

HEAVY CONSTRUCTION—LB & CA

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 North Office Bldg., Harrisburg, Bids opened 5/12, ROADS,

Pa.—**Burkholder & Burkholder**, P.O. Box 271, Winchester, Pa., LB **$1,803,292**, (6 bidders), 16,955 ft. divided hy. RCC 24 ft. wide each side median area; 2 bridges, Interstate A Sect. of Cumberland Valley Freeway, L.R. 799(1A), Franklin Co.;

Pa.—**W. L. Dunn Constr. Co.**, Cochranton, Pa., LB **$189,726**, (2 bidders), 14,529 ft. cr. agg. base with bit. surf. 20 ft. wide, L.R. 60036(1)-20028(1), Venango and Crawford Counties. CD 4/5/61.

BUILDINGS—LB & CA

▲ **Castagna & Son, Inc.**, 2110 Northern Blvd., Manhasset, N. Y., LB **$2,576,287**, (10 bidders), general contract JUNIOR HIGH SCHOOL, AMITYVILLE, N. Y. Bd. Educ., Amityville, N. Y. BA 5/12. CD 4/27/61.

▲ **Joseph P. Blitz, Inc.**, 545 Madison Ave., New York 22, N. Y., LB **$7,178,000** (5 bidders), fdns. and general contract (concrete), Proj. No. NYC-36, Mary K. Simkhovitch HOUSES, Henry St., Scammel St., Madison St., Gouverneur St., Water St., Jackson St., Franklin D. Roosevelt Dr. and Montgomery St., NEW YORK, N. Y. New York City Housing Auth., Rm. 1002, 299 Broadway, New York 7, N. Y. BA 5/16. CD 5/4/61.

S. S. Silberblatt, Inc., 25 W. 45 St., New York 36, N. Y., LB **$7,882,000** (5 bidders), fdns. and general contract (steel) Mary K. Simkhovitch HOUSES (New York, N. Y.).

Afgo Engineering Corp., 475 Adelphi St., Brooklyn 17, N. Y., LB **$721,631** (3 bidders), heating and ventilating (concrete) Mary K. Simkhovitch HOUSES (New York, N. Y.).

H. Sand & Co., 11 Park Pl., New York 7, N. Y., LB **$704,410**, (3 bidders), heating and ventilating (steel) Mary K. Simkhovitch HOUSES (New York, N. Y.).

Herman H. Schwartz, Inc., 97-11 Sutphin Blvd., Jamaica, N. Y., LB **$763,600** (7 bidders), electric (concrete) Mary K. Simkhovitch HOUSES (New York, N. Y.).

John G. Hellman Co., Inc., 507 E. 76 St., New York 21, N. Y., LB **$774,000** (7 bidders), electric (steel) Mary K. Simkhovitch HOUSES (New York, N. Y.).

A. Rosen & Son, 211 E. 117 St., New York 35, N. Y., LB **$988,800** (7 bidders), plumbing (concrete) and LB **$988,800**, plumbing (steel), Mary K. Simkhovitch HOUSES (New York, N. Y.).

Westinghouse Electric Corp., Elevator Div., 1271 Ave. of Americas, New York 19, N. Y., LB **$499,292** (5 bidders), elevator (concrete) and LB **$499,292**, elevator (steel) Mary K. Simkhovitch HOUSES (New York, N. Y.).

▲ **Tandy & Allien Constr. Co.**, 101 Park Ave., New York, N. Y., CA Est. approx. **$4,500,000**, 17 story APARTMENT, South Harrision St., EAST ORANGE, N. J. Harrision Towers Corp. of New York, 101 Park Ave., New York, N. Y. CD 5/8/61.

▲ **Sidney Halpern**, 16 West Main St., Somerville, N. J., Owner Builds, **$1,500,000**, 70 HOUSES, Brooks Blvd., HILLSBOROUGH, (SOMERVILLE P.O.), N. J. Donald Pantel, P.O. Box 272, Rte. 206, Somerville, N. J., archt. Tectonics Assoc., Rte. 206, Somerville, N. J., engrs.

▲ **Richard-Wilson Constr. Co.**, 100 Huguenot Ave., West Englewood, N. J., CA Est. **$2,500,000**, 15 story APARTMENT, Aycrigg Ave., PASSAIC, N. J. Passaic Towers, Inc., 100 Huguenot Ave., West Englewood, N. J. Isadore Naftali, 312 High St., Newark, N. J., archt.

▲ **Bayshore West Homes**, c/o Golden & Rappaport, Spring Harbor, N. J., Owner Builds, Over **$7,000,000**, 700 unit RESIDENTIAL DEVELOPMENT, VILLAS, N. J.

▲ **Somers Constr. Co., Inc.**, Union Ave. and Cynwyd Rd., Bala Cynwyd, Pa., CA Total est. **$8,000,000**, general contract superstructure ELECTRIC POWER PLANT EXPANSION PROGRAM, DOVER, DEL. City, City Hall, Dover, Del. CD 12/7/59.

▲ **Brentwood Manor Homes**, 6401 Castor Ave., Phila., Pa., Owner Builds, **$1,926,000**, RESIDENTIAL DEVELOPMENT (214), Medford Rd., PHILA, PA.

▲ **Tabone & Barbera**, 240 N. Main St., Pittston, Pa., CA Est. **$6,000,000**, SEMINARY, SCRANTON, PA. Our Lady of Abington, c/o Stickle & Assocs., archts., 2422 Prospect Ave., Cleveland, 15, O. BA 3/15/61. CD 2/13/61.

SOUTH

BUILDINGS—BA

▲ **Ala., Mobile**—BA 6/14—Mobile Co. Hospital Bd., c/o Mobile City Comn., City Hall, 9 story Mobile General HOSPITAL, Stanton Rd. and Fillingim St., $7,611,725. T. Cooper Van Antwerp, 354 St. Francis St., archt. CD 2/24/61.

HEAVY CONSTRUCTION—LB & CA

▲† **Western Contracting Corp.**, 400 Benson Bldg., Sioux City, Iowa, LB **$15,372,993**, Alt. B, DAM, DIKES, SPILLWAY, Summersville Reservoir, Gauley River, CIVENG-46-022-61-54, WEST VIRGINIA. U. S. Eng., 502 8th St., Huntington 1, W. Va. BA 5/16/61. CD 4/6/61.

▲ **Stupp Corp.**, P.O. Box 2548, Baton Rouge, La., LB **$1,477,874** (6 bidders), Proj. 6012, 194,000 lin. ft. steel pipe PILES for Wharf; LB **$602,436** (6 bidders), Proj. 6014, 460,000 lin. ft. steel pipe PILES, etc., for Wharf, NEW ORLEANS, LA. Bd. Comrs. Port of New Orleans, Rm. 204, No. 2 Canal St., New Orleans, La. BA 4/14. CD 3/20/61.

MIDDLE WEST

BUILDINGS—BA

▲† **Ill., Granite City**—BA About 6/22—U. S. Eng., 536 S. Clark St., Chicago, Zone 5, EQUIPMENT PROCESSING SHOP FACILITIES, Granite City Engineer Depot, ENG-11-032-61-89, approx. $1,400,000. Plans deposit $10. CD 1/2/51.

▲ **O., Kettering**—BA 6/27—Kettering Bd. Educ., Indian Riffle JUNIOR HIGH SCHOOL. $1,400,000. Rial T. Parrish, Knott Bldg., Dayton, archt. Arthur Scapelli, Knott Bldg., Dayton, engr. CD 2/28/61.

▲ **Mich., Owosso**—BA 6/22—Owosso P. Schools, 224 John St., HIGH SCHOOL and SWIMMING POOL. $3,870,000. Kingscott & Assocs., Inc., 511 Monroe St., Kalamazoo, archt.

HEAVY CONSTRUCTION—LB & CA

▲ **Freeman Constr. Co.**, Box 457, Wooster, O., CA **$2,175,000**, RESIDENTIAL CENTER for women, Bowling Green State University, BOWLING GREEN, O. State Dpt. P Wks., State Depts. Bldg., Columbus 15, O. BA 5/5/61, CA 5/11/61. CD 4/10/61.

▲ **Robert W. Setterlin & Sons Co.**, 2000 Kenny Rd., Columbus, O., CA Est. **$3,800,000**, general contract 12 story, 185 unit, concrete, glass, pink brick APARTMENT, COLUMBUS, O. Tibbals, Crumley, Musson, 965 East Broad St., Columbus, O. Paul J. Ford, 965 East Broad St., Columbus, O., engr. CA 5/4/61. CD 11/5/53.

▲ **ILLINOIS**—Dpt. P. Wks. & Bldgs., Div. Hys., Centennial Bldgs., Springfield, ROAD,

Standard Paving Co., 308 W. Washington St., Chicago, Ill., CA **$1,875,890**, pavement 5.7 mi. rein.-con. triple box culvert (for Oat Creek) FAI Rte. 80 from approx. ½ mi. east of Ill. 82, easterly, Henry Co. BA 4/21/61. CD 4/25/61, under LB.

▲ **Kenny Constr. Co.**, 3220 Oakton St., Skokie, Ill., CA **$1,500,000**, SITE PREPARATION, DREDGING HARBOR ENTRANCE, Lake Calumet, CHICAGO, ILL. Bulk Terminals Inc., 120 S. LaSalle St., Chicago 3, Ill. CD 3/22/61, under Industrial Buildings.

BUILDINGS—LB & CA

▲ **A. Bentley & Sons, Co.**, 201 Elm St., Toledo, O., CA Est. **$1,500,000**, 2 story branch DEPARTMENT STORE, for Lasalle & Koch Co., on Secor Rd., near W. Central, TOLEDO, O. L & K Properties Corp., 513 Adams St., Toledo, O. BA 5/2/61. CD 4/28/61.

MISSISSIPPI TO ROCKIES

BUILDINGS—BA

▲ **Mo., Warrensburg**—BA 6/9—Central Missouri State College, 270-Men's DORMITORY and 340-Women's DORMITORY. $1,500,000. Mantel & Steele, 4550 Main St., Kansas City, Mo., archts.-engrs. CD 4/26/41.

BUILDINGS—SLC

▲ **Mo., Frontenac (St. Louis 31 P.O.)**—Shriners Hospital for Crippled Children, 700 S. Kingshighway, St. Louis, Zone 10, soon lets contract 2 level, ground floor 112 x 248 ft. and 60 x 165 ft. HOSPITAL; 2 story, bsmnt., 51 x 302 ft. LOUDERMAN BLDG. (Residential and Research), Lindbergh Blvd. and Litzsinger Rd. Over $2,000,000. Sverdrup & Parcel & Assocs., Inc., 917 Olive St., St. Louis, Zone 1, archt.-engr. CD 9/17/57.

PROVIDE YOUR HOMES WITH LIFETIME PROTECTION AGAINST MOISTURE MIGRATION!

Premoulded Membrane
TRADEMARK

VAPOR SEAL

Today's sophisticated home buyer realizes that the problems of excessive moisture must be eliminated. Dampness, condensation, paint and insulation failures, mildew, etc., can be eliminated only with the installation of a *true* vapor seal . . . "Premoulded Membrane." Provide that "quality" extra needed for sales . . . protect your homes and business reputation . . . eliminate "call-back" costs . . . with "PM," the original *true* vapor seal.

FEATURES OF "PM"...

- Waterproof . . . water-vapor transmission rating of only .0066 grains per hour per square foot.
- Strong . . . will not rupture or tear during installation handling, trundling of wheelbarrows or pouring of aggregate.
- Provides a *monolithic* vapor seal without voids or open seams.
- Permanent . . . will last the lifetime of the structure.

Write for complete information. Request your free copies of Bulletin No. 16 and Catalog No. 1660.

W. R. MEADOWS, INC.

16 KIMBALL ST. • ELGIN, ILLINOIS

Hook an OWEN Clamshell Bucket to your crane and you're *sure* of superior performance and longer life. For OWEN Buckets have exclusive super-efficiency and long-lived features you won't find in ordinary clamshells.

For instance:

- Block and tackle type reeving
- One-piece head construction
- Recessed lips
- Single main shaft
- Riveted bowl assembly

For over half a century OWEN has been building clamshell buckets—tailored to meet the requirements of "men who move the earth the world over".

So team your crane to the bucket with the BIG BITE that's JUST RIGHT for every job!

Write today for the money-saving facts and figures.

The OWEN

BUCKET COMPANY

BREAKWATER AVENUE • CLEVELAND 2, OHIO

BRANCH OFFICES: New York • Philadelphia • Chicago • Berkeley, California • Fort Lauderdale, Florida

HEAVY CONSTRUCTION—LB & CA

▲† **Forcum-Lannom, Inc.**, Clark St., Dyersburg, Tenn., CA **$1,522,271**, WATER SUPPLY SYSTEMS, Titan II Missile Launch Facilities, Little Rock Air Force Base, ENG-04-548-61-31, LITTLE ROCK, ARK. U. S. Ballistic Missile Constr. Office, 5651 West 96th St., Los Angeles, Calif. Low Bidders allowed to withdraw. CD 4/25/61, under CA.

▲† **H. B. Zachry**, Box 10188, San Antonio, Tex., CA **$1,487,494**, EARTHWORK, CONCRETE LINING, STRUCTURES, for Main Canals, San Angelo Proj., DC 5566, San Angelo, TEXAS. Bureau Reclamation, Dpt. Interior, Bldg. 53, Denver Federal Center, Denver, Colo. BA 5/4/61. CD 5/8/61.

▲ **Nolan Bros., Inc.**, P.O. Box 218, Wichita Falls, Tex., LB **$6,457,163**, (9 bidders), Sunnyvale East Side WATER TREATMENT PLANT, DALLAS, TEX. City, City Hall, Dallas, Tex. BA 5/15/61. CD 4/10/61.

BUILDINGS—LB & CA

▲ **C. Rallo Contg. Co., Inc.**, 5000 Kemper Ave., St. Louis 39, Mo., LB **$1,925,000**, four 4 story RESIDENCE HALLS, one for 210 women and three for 282 men each, east of Big Bend Blvd., between Forsyth and Wydown Blvds., Proj. CH MO-60(D), ST. LOUIS, MO. Washington University, Lindell and Skinker Blvds., St. Louis 30, Mo. BA 5/11. CD 4/12/61.

▲ **Peter Kiewit Sons Co.**, 1024 Omaha National Bank Bldg., Omaha, Neb., CA **$1,724,950**, general contract 125,000 kw. fourth unit North Omaha STATION, Proj. 278, OMAHA, NEB. Omaha Public Power Dist., 803 Electric Bldg., Omaha, Neb. BA 5/4/61. CD 5/10/61, under LB.

▲ **Butcher & Sweeney**, 1633 Rogers Rd., Fort Worth, Tex., CA **$2,709,900**, general contract, 12 story, CRIMINAL COURTS and JAIL, FORT WORTH, TEX. Tarrant County, Fort Worth, Tex. BA 5/4/61. CD 5/8/61, under LB.
Southern Steel Co., 4634 S. Presa St, San Antonio, Tex., CA **$778,863**, JAIL EQUIPMENT for County jail and criminal courts bldg., (San Antonio, Tex.)

▲ **Mellwin Constr. Co.**, 35 South Fox, Denver, Colo., CA general contract 3 story, 70,000 sq. ft. RECREATION FACILITIES, DENVER, COLO. Jewish Community Center, 1475 Williams, Denver, Colo., Nat S. Sachter, 111 Adams, Denver, Colo., and Robert M. Morris, 330 W. Asbury Ave., Denver, Colo., archts. Total est. **$1,500,000**. CD 3/11/60, under CA.
Natkin & Co., 2201 S. Delaware, Denver, Colo., CA, 3 story, 70,000 sq. ft. mechanical for RECREATION FACILITIES, (Denver, Colo.)
Acme Electric Co., 3820 Forest, Denver, Colo., CA 3 story, electrical for RECREATIONAL FACILITIES, (Denver, Colo.)

FAR WEST

BUILDINGS—BA

▲ **Idaho, Arco**—BA 6/20—Atomic Energy Comn., Idaho Field Office, (SNROO) P.O. Box 2469, Idaho Falls, Phase I constr. work, Proj. S 5G, Naval Reactor Facility, National Reactor Testing Station, structural steel TEST PLANT, Inv. AE 61-SCH 496, $1,500,000. CD 7/29/59.

▲ **Hawaii, Honolulu**—BA 6/29—University of Hawaii, Bd. Regents Bachman Hall, Universiy and Wilder Ave., Stage I, East-West Center, high rise DORMITORY, EW-HRD-1; low rise DORMITORY EW-LRD-1; TRANSIENT QUARTERS, EW-TQ; ADMINISTRATIVE FOOD SERVICE, EW-AFS; THEATRE-AUDITORIUM EW-AUD $6,300,000. Plans deposit $200. Clifford Young & I. M. Pei, Rm. 207 931 University Ave., Honolulu, Hawaii, archts. CD 11/22/60.

BUILDINGS—SLC

▲ **Calif., San Diego**—Convair Astronautics, Purchasing Dpt., 5001 Kearney Villa Rd., Zone 11, soon lets contract 1 story, 171,000 sq. ft. tilt-up Convair ENGINEER and PRODUCTS SUPPLY BLDG. $3,000,000. Jack R. Lewis, 4772 Idaho St., Zone 16, archt. CD 5/4/56.

HEAVY CONSTRUCTION—LB & CA

▲ **IDAHO**—Dpt. Hys., 3211 State St., Boise, Bids opened 5/9. ROAD,
Peter Kiewit Sons Co., Idaho Falls, Idaho, LB **$1,588,104**, (4 bidders), roadway, drainage structures, 80 ft. concrete bridge 9.614 mi. Interstate 15, Idaho Falls-Bassett roadway, 2 mi. connecting roadways, with 55 ft. concrete bridge, Bonneville and Jefferson Counties. CD 4/24/61.

▲ **Morrison-Knudson Co., Inc.**, 319 Broadway Ave., Boise, Idaho, and NATOMAS CO., 111 Sutter St., San Francisco, Calif., CA **$4,500,000**, WATER SYSTEM, SEWERAGE FACILITIES, ROADS and ACCESS ROUTES, Incline Village, LAKE TAHOE, NEV. Crystal Bay Development Co., Lake Tahoe, Nev.

▲† **Carl Carbon, Inc., N. A. Degerstrom and Crick & Sons**, N. 3430 Cook St., Spokane 21, Wash., CA **$1,619,154**, REPAIR PRIMARY RUNWAY and TAXIWAYS, Kingsley Falls, Field, IFB 35-610-61-40 KLAMATH FALLS, ORE. Base Procurement Office, Kingsley Field, Klamath Falls, Ore. BA about 4/20/61. CD 3/28/61.

▲ **South Sutter Water Dist.**, P.O. Box 62, East Nicolas, Calif., rejected bids May 8, Camp Far West Proj. (A) EARTHFILL DAM and APPURTENANCES. (B) CONVEYANCE CANAL, PROTECTION DIKE, APPURTENANCES, near Wheatland, Yuba and Placer Counties,

CALIFORNIA. $6,000,000. Will re-advertise. CD 4/21/61.

▲ **Guy F. Atkinson Co.**, P.O. Box 259, Long Beach, Calif., LB $1,543,700, est. $2,000,000, (4 bidders), 2,100 ft. open concrete WHARF, Berths 136-139, Wilmington, LOS ANGELES, CALIF. Los Angeles Harbor Dpt., City Hall, Los Angeles, Calif. BA 5/10. CD 4/12/61.

▲ **HAWAII**—State Hy. Dpt., 869 Punchbowl, Honolulu, bids opened 5/11, ROAD, **Territorial Contractors**, 803 Mapunapuna, Honolulu, Hawaii, LB $2,038,049, (3 bidders), Kauai Belt Rd. (Kalihiwai Section), Emergency Relief, Proj. ER-00070102, Kauai Co. CD 4/18/61.

BUILDINGS—LB & CA

▲ **Carter Mack, Inc.**, 25100 South Normandie Ave. W., Harbor City, Calif., LB $2,901,000, (9 bidders), Charles Drew JUNIOR HIGH SCHOOL, Firestone and Compton Blvds., LOS ANGELES, CALIF. Bd. Educ., 1426 S. San Pedro St., Los Angeles, Calif. BA 5/16. CD 5/3/61.

▲† **Alcan-Pacific Co.**, 1921 Stockton Block, Sacramento, Calif., LB $2,438,950, Base with Additives, (5 bidders) 150 unit CAPEHART HOUSING, U. S. Naval Post Graduate School, MONTEREY, CALIF. Dist. P. Wks. Office, 12th Naval Dist., Rm. C 112, San Bruno, Calif. BA 5/16. CD 5/8/61.

▲ **Carlton Builders**, 246 S. Robertson Blvd., Beverly Hills, Calif., CA Est. $1,600,000, 79 DWELLINGS, Tract 22969 and 25324, TARZANA (LOS ANGELES), CALIF. I. N. S. Corp., Clifford Machine Co., Tera Land Co., Ed-Nor Corp., Flora Land Co., Graham Equipment Co., 246 S. Robertson Blvd., Beverly Hills, Calif. Raymond D. Conwell & Assoc., 919 S. Grand Ave., Los Angeles 22, Calif., archts.

CANADA

BUILDINGS—BA

▲ **Ont., Ottawa**—BA 5/30—Carleton University, 268 1st Ave., Ottawa, two RESIDENCES, LECTURE HALL, ARTS BLDG., ADDN., EATING CENTER, $3,000,000. Balharrie, Helmer & Morin, 77 Metcalfe St., archts. Prof. Eric Arthur Campbell Merrit, John Bland & Hart Massey, 77 Metcalfe St., assocs. archts. CD 2/7/61.

▲ **Ont., Toronto**—BA 6/1—The Salvation Army, 20 Albert St., TRAINING COLLEGE, Bayview Ave. $1,500,000. Marani, Morris & Allan, 1250 Bay St., archts. Reicher, Bradstock & Assocs., 600 Eglinton Ave. E., engrs. CD 5/5/60.

BUILDINGS—SLC

▲ **Que., Montreal**—Imperial Bank of Canada, 610 St. James St. W., soon lets contract 16 story, BANK and OFFICE, air-conditioned, St. James and McGill Sts. $1,500,000. Ross, Fish Duschenes & Barrett, 4115 Sherbrooke St. W., archts. CD 4/27/61.

HEAVY CONSTRUCTION—LB & CA

▲ **Bedford Constr. Co., Ltd.**, 36 Brydon Dr., Rexdale, Ont., LB $3,685,378, (8 bidders), Contract 4, PRIMARY and DIGESTION SEWER TANKS, sludge lagoons, related structures, OTTAWA, ONT. City, City Hall, Ottawa, Ont. BA 5/2/61. CD 4/4/61.

▲ **Mc Namara Marine Ltd.**, 57 Industrial St., Toronto, Ont., LB $1,480,600, DREDGING St. Lawrence River ship channel between Montreal and Quebec City, QUEBEC. Dpt. Transport, Hunter Bldg., Ottawa, Ont. BA 5/3/61. CD 4/27/61.

BUILDINGS—LB & CA

▲ **Principal Investments Ltd.**, 113 Richmond St. W., Toronto, Ont., Owner Builds, $1,500,000, SHOPPING CENTER, Dundas St. E., BELLEVILLE, ONT. CD 8/11/60.

▲ **Ellis Don Ltd.**, Box 852, London, Ont., CA $2,991,717, (14 bidders), MENTAL HOSPITAL, 1 story cottages, 2 story wings, 2 story administration bldg., OWEN SOUND, ONT. Dpt. P. Wks., Parliament Bldgs., Queens Park, Toronto, Ont. BA 4/12/61. CD 4/18/61, under LB.

▲ **Harry Davidson & Max Tanenbaum**, c/o Freedman & Petroff, archts., 3130 Bathurst St., Toronto, Ont. Owner Builds, $2,000,000, 100,000 sq. ft. steel frame rein.-con. glazed brick DISCOUNT STORE, two SUPERMARKETS, other stores, SE corner Finch Ave. W. and Jane St., TORONTO, ONT. Alex Tobias & Assocs., Ltd., 194 Wilson Ave., Toronto, Ont., engrs.

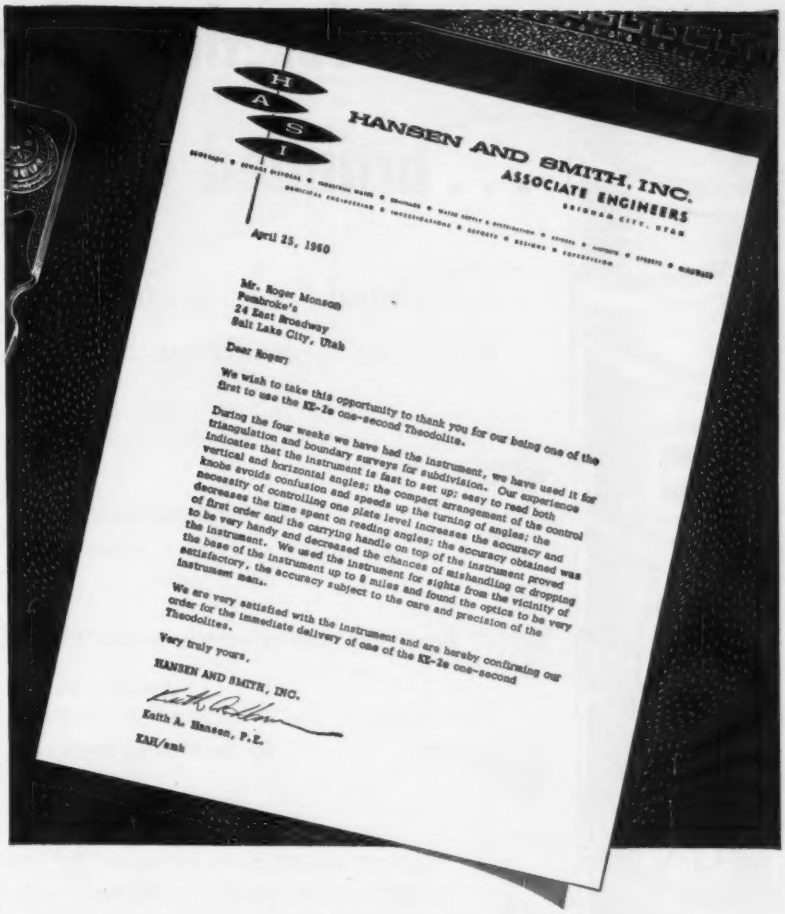
▲ **Francois Jobin, Inc.**, 925 Ste. Therese St., Quebec City, Que., CA Est. $5,000,000, 2 and 3 story, 5 wings rein.-con., brick, stone HIGH SCHOOL and PENSIONNAT, corner Ste. Foy Rd. and Vallon St., STE. FOY, QUE. Rev. Freres des Ecoles Chretiennes, 2360 Chemin Ste. Foy, Ste. Foy, Que. CD 1/4/61.

▲ **Roland Gendron**, 1405-124th St., Shawinigan, Que. CA Est $1,500,000, 3 story DOMESTIC SCIENCE SCHOOL, 340 ft. front, des Forges Ward, THREE RIVERS, QUE. Congregation des Filles de Jesus, 1193 St. Louis Blvd., Three Rivers, Que. CD 4/10/61.

AMERICANS ABROAD

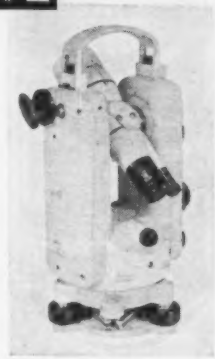
BUILDINGS—LB & CA

▲ **John Brown, Ltd.**, Melbourne, Australia, CA Est. $15,750,000, OIL PROCESSING PLANT near existing refinery, KWINANA, AUSTRALIA. British Petroleum, Ltd., London, England. Foster-Wheeler Ltd., London, England, Associate of Foster Wheeler Corp., 666 Fifth Ave., New York 19, N. Y., U.S.A., engrs.


H
A
S
I
HANSEN AND SMITH, INC.
ASSOCIATE ENGINEERS
April 25, 1960
Mr. Roger Monson
Pembroke's
24 East Broadway
Salt Lake City, Utah
Dear Roger:
We wish to take this opportunity to thank you for our being one of the first to use the KE-2e one-second Theodolite.
During the four weeks we have had the instrument, we have used it for triangulation and boundary surveys for subdivision. Our experience indicates that the instrument is fast to set up; easy to read both vertical and horizontal angles; the compact arrangement of the control knobs avoids confusion and speeds up the turning of angles; the decreases the time spent on reading angles; the accuracy obtained was necessity of controlling one plate level increases the accuracy and of first order and the carrying handle on top of the instrument proved to be very handy and decreased the chances of mishandling or dropping the instrument. We used the instrument for sights from the vicinity of the base of the instrument up to 8 miles and found the optics to be very satisfactory, the accuracy subject to the care and precision of the instrument man.
We are very satisfied with the instrument and are hereby confirming our order for the immediate delivery of one of the KE-2e one-second Theodolites.
Very truly yours,
HANSEN AND SMITH, INC.
Keith A. Hansen, P.E.
KAH/emh

Already proved in practice!

The new KE-2e Theodolite by K+E



Prompted by an extensive survey to determine what *American* surveying practice called for in a theodolite, the brilliant, new KE-2e has excited widespread interest throughout the engineering fraternity for its many important and exclusive design features. Letters of acclaim, like the one above lauding the KE-2e's first-of-its-kind performance, reflect a perfect mating of surveying instrument to field requirements.

A few minutes trial with this 1-second, directional, erected image theodolite will show you what *you've* been missing in theodolite performance. To arrange for a demonstration, get additional information, or both – simply fill out and mail the coupon below:

K+E

KEUFFEL & ESSER CO.

NEW YORK • HOBOKEN, N. J. • PHILADELPHIA • DETROIT
CHICAGO • MILWAUKEE • ST. LOUIS • DALLAS • DENVER
SAN FRANCISCO • LOS ANGELES • SEATTLE • MONTREAL

KEUFFEL & ESSER CO., Dept. EN-5 Hoboken, N. J.

Gentlemen:

☐ Please have a K&E representative make an appointment to show me the KE-2e Theodolite.

☐ Please send me additional information on the KE-2e Theodolite.

Name & Title: _____

Company & Address: _____

_____

4048

Look for the strength ... branded on the bar

For quick, positive identification of Bethlehem high-strength reinforcing bars

"B" for Bethlehem.

Bar size number (always between "B" and "-N-").

"-N-" for new billet steel.

High-strength bars have a "6" for the 60,000 psi min. yield (A-432) bars, and a "7" for the 75,000 psi min. yield (A-431) bars.

All Bethlehem bars have a pedigree

Certified mill test reports, furnished by Bethlehem, are matched with heat numbers by which the bundles of bars are identified. When you buy Bethlehem bars you are assured of composition, mechanical, and physical properties fully meeting all requirements of ASTM Billet-Steel Bar Specifications—a certified pedigree.

New booklet has helpful data on high-strength bars

A new booklet contains practical information about Bethlehem high-strength bars, some aspects of new design theories (with consequent savings in money and materials), proper welding techniques, and details on the king-sized bars, 14S and 18S. A copy is yours by writing any Bethlehem sales office, or directly to us at Bethlehem, Pa.

Steel
For strength
. . . economy
. . . versatility

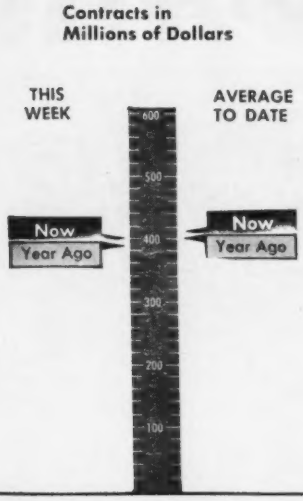
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
Export Sales: Bethlehem Steel Export Corporation

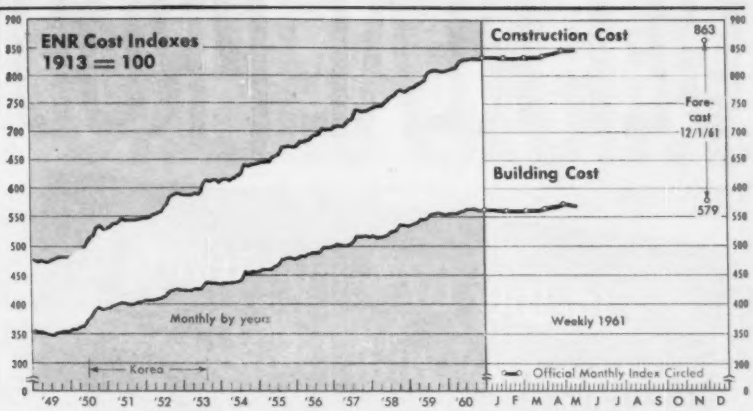
BETHLEHEM STEEL

BETHLEHEM STEEL

Construction Scoreboard

This Week . . .




ENR Cost Indexes 1913 = 100
Construction Cost
863
Fore-cast 12/1/61
Building Cost
579
Monthly by years
Weekly 1961
Korea
Official Monthly Index Circled
'49 '50 '51 '52 '53 '54 '55 '56 '57 '58 '59 '60
J F M A M J J A S O N D

ENR INDEXES (1913=100), 20-cities' average	Week of May 11 1961	% Change from Apr 13 1961	% Change from May 12 1960
Construction Cost	848.68	+1.02	+3.2
Building Cost	569.17	+0.3	+1.9

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.850.
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518.

AMOUNT OF CONTRACTS LET

Contracts Awarded In 50 States By Type	This Week millions	Cum. 21 wks 1961	Chge '60-'61 %
All Heavy Construction	$400.0	$8,538.3	+ 1
By Ownership			
PRIVATE	228.1	4,365.4	− 4
PUBLIC	171.9	4,172.9	+ 6
State & Municipal	123.6	3,205.9	+ 6
Federal	48.3	967.0	+ 6
By Type of Work			
PUBLIC			
Waterworks	4.0	149.7	−18
Sewerage	7.6	287.0	+35
Bridges*	1.2	225.6	−36
Highways	33.8	1,415.0	+13
Earthwork, Dams & Waterways	26.2	337.8	+17
Buildings			
Excl. Housing	60.8	980.5	+ 5
Housing	23.5	301.0	+48
*Unclassified	14.8	476.3	− 9
PRIVATE			
Buildings:			
Mass Housing	132.5	1,923.1	−15
Commercial	51.2	974.3	+14
Industrial	40.7	1,276.7	+25
Unclassified	3.7	191.3	−51

*Includes Private bridges

NOTE: Minimum size projects included are: Waterworks and waterways, $53,000; other public works, $88,000; industrial buildings, $110,000; other buildings, $400,000.

NEW CONSTRUCTION CAPITAL

	Week of May 18 millions	Cum. 20 wks 1961	Chge '60-'61 %
Corporate Securities	$160.1	$1,291.0	+21
State and Municipal:			
All Except Housing	156.8	2,438.1	− 7
Housing	0	29.7	+118
Federal Loans	0.6	79.1	+19
Federal Aid	0	0	−100
Total Nonfederal	$317.5	$3,837.9	−41
Federal Appropriations:			
Projects in U. S.	0	1.0	−99
Outside U. S.	0	0	−100
Total New Capital	$317.5	$3,838.9	−43

Latest Month . . .

BACKLOG OF PROPOSED HEAVY CONSTRUCTION

	April 1961 (millions)	Percent Change from last Month	Year
Total U. S. (ENR reported)	$124,959	−0.3	+2.3
By Ownership—			
Private	56,248	−0.2	+3.7
State & Municipal	54,588	−0.3	+1.7
Federal	14,123	−0.9	−1.1
By Type of Work—			
Waterworks	3,080	+0.7	+6.5
Sewerage	4,247	+1.4	+9.2
Bridges	3,287	−0.07	−1.3
Highways	13,447	−0.9	−2.8
Earthwork, Dams and Waterways	11,907	−1.1	−0.5
Public Buildings	22,849	+0.03	+3.2
Industrial Buildings	17,452	−0.9	+0.5
Commercial Buildings	27,992	+0.1	+6.6
Unclassified, Private	10,804*	+0.5	+1.7
Unclassified, Public	9,894	−1.1	+0.1

* Includes Private Bridges, $101 million

FLOW OF NEW PROJECTS INTO THE BACKLOG

	1961 April (millions)	1961 4-months (millions)	Percent Change from 1960 April	4-Mos.
Total U. S. (ENR reported)	$1,349	$7,322	− 4	−17
By Ownership—				
Private	726	4,174	−15	−15
State & Municipal	535	2,824	+ 2	−18
Federal	88	324	+138	−30
By Type of Work—				
Waterworks	58	336	+57	+152
Sewerage	105	316	+94	+38
Bridges	18	134	+260	+42
Highways	70	428	−36	−67
Earthwork, Dams and Waterways	16	33	+78	−48
Public Buildings	304	1,676	− 4	− 2
Industrial Buildings	123	1,315	−43	+17
Commercial: Mass Housing	210	1,158	−40	−54
Other Building	306	1,322	+30	+25
Unclassified, Private	87	379	+81	+72
Unclassified, Public	52	225	+79	−44

FLOW OF PROJECTS OUT OF BACKLOG INTO CONTRACTS

Total U. S.)ENR reported)	951	3,565	+10	+11
By Ownership—				
Private	307	1,378	− 9	+ 9
State & Municipal	508	1,617	+25	+17
Federal	136	570	+16	+ 3

GET REAL PRODUCTIVITY

When you can get a twelve-year-old shovel to move 1800 tons a day on only 15 gallons of fuel—and "perform with the responsive smoothness and economy of a new shovel"—you're getting real productivity!

And that's exactly what South Jersey Construction Co., Riverside, New Jersey, got when they repowered their ¾-yard Link-Belt with a "3-71" GM Diesel.

With the previous gasoline engine, they were burning 40 to 45 gallons of fuel a day. Their 3-71 "Jimmy" has cut this to only 15 gallons of lower-cost Diesel fuel.

South Jersey Construction have found their GM Diesel powered equipment more economical, say this about its performance—"We let the GM Diesels go five months without attention, merely changing lube oil as we go. The equipment with GM Diesels never seems to lose power. Acceleration is snappy and there's plenty of reserve power."

If that's the kind of productivity and performance you'd like from your equipment, specify GM Diesel when you buy or repower. There's a model to fit nearly every type of construction equipment. For details, see your GM Diesel Distributor. He's in the Yellow Pages under "Engines, Diesel," or write for more information.

GM DIESEL ALL-PURPOSE

GET A GM DIESEL ENGINE

"The Trojan with the GM Diesel is a fast-moving, highly maneuverable piece of equipment that seems to be all over the yard at one time," says Charlie Young, Plant Manager for Young Bros. Contractors, Waco, Texas.

Young Brothers have used this Model 154 Trojan Loader with a "3-71" GM Diesel since March 1959—are very pleased with its performance and productivity. The unit stockpiles and services an asphalt plant and crusher—moves up to 1200 tons per day.

"It does the work ordinarily requiring two pieces of equipment, thereby saving us the investment and upkeep of a second unit," says Mr. Young.

That's the kind of profit-making productivity Young Brothers have come to expect from their "Jimmys." They bought their first GM Diesel powered unit in 1946—now operate 22 GM Diesels.

How about you? Ready to repower or buy new equipment? Get the facts on GM Diesel power. See your GM Diesel Distributor. He's in the Yellow Pages under "Engines, Diesel," or write direct.

POWER LINE Sets the standard of Diesel productivity

GM DIESEL

DETROIT DIESEL ENGINE DIVISION,
GENERAL MOTORS, DETROIT 28, MICH.

In Canada: GENERAL MOTORS DIESEL LIMITED, London, Ontario
Parts and Service Worldwide

Too late now! The bids are in. You did your best. But even your best isn't good enough without a bond. That's why it pays to have The Travelers umbrella of protection. When you want a bond, you get it *right away* and you get it *right* . . . from The Travelers. A bond specialist is on the spot often within hours. He's an expert on *local* requirements, knows what you need and don't need to save precious time. Contact him by calling the same man you can call for *all* business insurance—Workmen's Comp, Equipment Floaters, Builders' Risk, Boiler and Machinery--your local Travelers man!

THE TRAVELERS Insurance Companies HARTFORD 15, CONNECTICUT

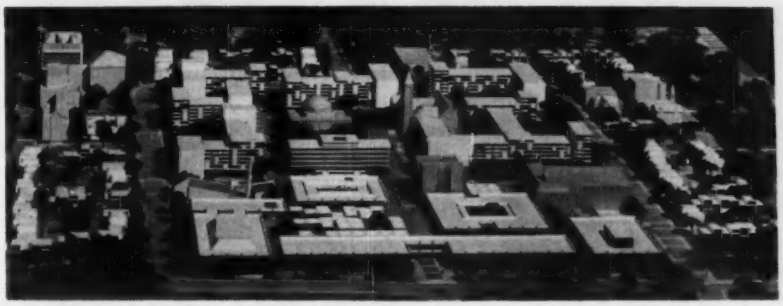
Aluminum After Big Jobs, Small Homes

Aluminum Co. of America last week took a first step toward filling the growing demand for shell housing, and moved deeper into the development of major commercial-residential projects.

The shell housing operation may prove significant in terms of construction, economics and home merchandising. The basic idea is not new—shell houses have been on the market five or six years. But Alcoa and a Philadelphia-based development company have worked out a new wrinkle. The builder, Major Realty Co., will erect the shells contiguously in a 2,000-acre tract near Jacksonville, Fla. Up to now, shell houses have turned up on as many scattered lots as there are buyers. They then become do-it-yourself projects.

But at the 4,000-unit Jacksonville development, Major Realty will provide either the shell, or a completed product, or any stage of work between the extremes. A shell will cost $2,950 including lot; a completed house will cost about $7,500.

One interesting long-shot possibility looms for the developer; the Federal Housing Administration may eventually decide that shell housing qualifies for an insured home improvement loan. The housing bill working through Congress now provides loans of up to $10,000 for a maximum of 25 years. If shell housing, now excluded from FHA programs, were made eligible under the new program, the shell housing market would take on huge dimensions. It could become the answer to the knotty problem of providing the low-cost housing government officials and economists say is urgently needed.



ALUMINUM CO. OF AMERICA will participate in this $50-million Pittsburgh project.

Alcoa and its customers will supply the various components for the houses. Outer walls of the houses are 1-in.-thick sandwich panels of aluminum, plastic foam insulation and compressed-fiber hardboard. Roof sections will be backed with bonded plastic foam to deaden rain noise and prevent condensation. Primary roof insulation will be installed in a suspended aluminum ceiling system.

In Pittsburgh, Alcoa bit deeper into the big-project market. With Lewis E. Kitchen, Kansas City, Mo., developer, the company will participate in construction of a $50-million urban redevelopment project (picture). The company will be aluminum consultant and supplier and assist in financing. It is Alcoa's first participation in a Title I redevelopment project. The company, however, is involved in three non-government-aided projects—the $250-million Century City in Los Angeles, a $45-million residential-commercial project in St. Louis and a $40-million apartment and office building in New York City.

The 78-acre Pittsburgh project, across the Allegheny River from the Golden Triangle, will contain several six- and seven-story apartment buildings, 200 one- and two-family houses, and underground garage for 2,000 cars, and stores.

Standard Specs Wanted in California

A uniform set of specifications for southern California public works jobs may result in about a year from a study just started.

Cooperating are the Southern California chapters of the Associated General Contractors and the American Public Works Association. The action is in line with similar efforts in other parts of the nation.

The California study will cover three major areas of specifications—general contract provisions, construction materials provisions and technical provisions.

Five major agencies hold responsibility for public works projects in Los Angeles city and county, and each one issues separate sets of specifications. The agencies are the County Engineer's Office, County Road Department, County Flood Control District, County Sanitation District and the City Engineer's Office. Together they now have $193 million worth of construction under way.

Industry spokesmen say uniform specifications could save hundreds of thousands of dollars in construction costs by:

- Increasing the number of contractors bidding on projects. Many contractors now limit bidding to the agencies whose specifications they are familiar with through experience.
- Obtaining increased uniformity of materials. Manufacturers could produce construction items with fewer variations. One manufacturer lists 39 different manhole frames and cover designs just to meet the various design specifications of public agencies in the Los Angeles area. Uniform specifications could cut the number to five or six.
- Decreasing contractors' preliminary work.
- Boosting on-site efficiency because of fewer technical variations.

Standardized specifications would also save money for other cities in southern California. Many that now use the standards of one or more of the major agencies could be expected to fall into line on uniform specifications.

AGC and APWA worked together on a similar project in Washington State. From that effort came uniform highway construction standards. This project was underwritten by the State Highway Development.

Other AGC chapters reaching for uniform specifications include the Texas Heavy, Municipal and Utilities Branch in Dallas, the Jefferson City and St. Louis branches in Missouri and the Minnesota AGC.

Business in Brief . . .

• **Quaker City improvement**—Philadelphia will take bids next month on $25 million worth of bonds to finance capital improvements. Funds will help pay for street improvements, health centers, ports and airfields, libraries and redevelopment.

• **Five-year plan**—Ohio will spend $2 billion on highways in the next five years, says Director E. S. Preston. The estimate includes cost of right-of-way, engineering, construction and contingencies.

• **Construction to follow**—Architectural design contracts for four buildings at Washington State University went to Ralph H. Burkard, Seattle; Cowan and Paddock, Yakima; Victor L. Wulff, Spokane; and Doudna, Williams and Phipps of Yakima. Building costs are estimated at more than $3 million.

• **Building outlays up**—Expenditures for new buildings construction in Pennsylvania last year totaled at least $860.4 million, says the state's Department of Labor and Industry.

• **Economic spark**—Eight investor-owned Ohio power companies will spend $3 billion in the next 10 years for generating, transmission and distributing facilities. About $200 million will be spent this year, says William H. Zimmer, president of Ohio Electric Utility Institute.

• **Canadian investment**—Industry will spend more than $5 billion this year in Canada for new plants, according to the industrial development branch of the Department of Trade and Commerce.

• **Legal knot cut**—Dismissal of a suit contesting a city zoning ordinance permitting a shopping center in Columbus cleared the way for construction of a $12-million commercial development. Work will start next year.

• **Still the Golden West**—Construction in California will flourish in the next 20 years, says Stanford Research Institute of Menlo Park, Calif. The study indicates California's growth rate will continue to outstrip that of the rest of the nation, although rate of the '50s will not be matched.

• **Miami airport job**—Dade County Port Authority plans the sale of bonds that will finance construction of a $16-million jet airliner overhaul base at Miami International Airport.

• **Dallas skyscrapers**—Work will start shortly on a 26-story apartment building in Dallas' downtown. It's part of a commercial and residential center planned by J. Curtis Sanford.

• **Most for the elderly**—Of 1,000 new public housing units planned by the Philadelphia Housing Authority, 750 would be for persons 62 and over. The authority says outlays will total $10 million.

• **Lock-up signed up**—Construction contract for $11.2-million Los Angeles County Jail went to Gust K. Newberg Construction Co., Los Angeles. Another contract of $5.2 million for a county women's jail was awarded to Tom E. Norcross, Inc. of Long Beach.

• **Subtracting from ads**—North Dakota just became the nation's second state to agree to control billboard advertising along Interstate routes. For this the state gets an additional 1½% in federal highway aid.

• **Bonds approved**—Voters in Eugene, Ore. approved a $2.4-million bond issue proposal that will pay for construction of a new City Hall. Architects are Stafford, Morin & Longwood, of Eugene. In Harrisburg, voters said "yes" to a $5-million courthouse bond issue, but they rejected a $1.9-million issue for urban redevelopment.

• **Price index drops again**—The Bureau of Public Roads composite mile bid index for 1961's first quarter dropped 1.2% below the last quarter of 1960. The index now stands at 133.4, ten points below 1957's record high. Why the drop? Tough competition for jobs.

• **Shell business**—Empire National Corp. and All-State Properties, Inc., of New York City, have formed American International Housing Corp. for the purpose of designing, distributing and selling shell and prefabricated houses in the U. S. and abroad.

Equipment Dealers Seek Better Equipped Salesmen

Look for a harder sell on construction equipment if an Associated Equipment Distributors plan for upgrading salesmen hiring practices goes through.

As the third prong of a three-pronged attack on improving salesmanship, the AED plans to provide its 1,300 members with a sales recruitment screening service that will weed out weak sisters before they are hired. The other two prongs, already in use, are management conferences for sales executives and institution of a college curriculum in construction equipment distribution.

Science Research Associates of Chicago has been hired by the AED to study equipment salesmen and work up criteria for salesman selection. They have concluded that nearly a quarter of the salesmen now selling construction equipment are not up to par. Since they estimate that a poor salesman costs the distributor up to three times his salary in missed sales, they intend to assist distributors in spotting non-producers before they are put to work.

For $35, Science Research Associates will evaluate a written test given a job candidate and recommend whether or not to hire the man.

AED, which has spent $4,000 to have the service developed, expects up to 60% of its members to subscribe.

Government Hits Again At Materials Price Fixing

A federal grand jury last week returned a price-fixing indictment against eight building supply companies in the Washington, D. C. area and six of the companies' executives.

The alleged conspiracy tended to raise prices of portland cement, masonry cement and mortar, building lime, plaster products, metal lath and wire mesh, according to the indictment. The agreements, started as early as 1958, affected about two-thirds of the sales in the area, the government says.

Named in the indictment were A. P. Woodson Co., Eckington Building Supply Co., Hudson Supply & Equipment Co., R. Robinson, Inc., Cushwa Brick & Building Supply Co., United Clay Products Co., Potomac Builders Supply Co., and District Building Supply Co.

Alleged co-conspirators included members of the building supply division of the Merchants and Manufacturers Association of Washington. About $6.8 million in sales to contractors, public and private bidders and the general public were involved, the government says.

New Look for the Labor Board?

- **The National Labor Relations Board may delegate decision-making power to its trial examiners.**
- **The proposal, which needs congressional approval, would bring faster relief in labor disputes.**

The five-member National Labor Relations Board, pressed by a mounting total of labor-management conflict cases, is seeking a major overhaul of its system for settling labor disputes.

Essentially, the Board members want to share the power that they alone hold to decide unfair labor practice complaints from unions and employers. They would turn over this authority to the agency's 64 NLRB trial examiners. But they would retain the right to reverse any examiner decisions they believe to be incorrect.

Their aim is to get much quicker processing of the heavy case-load—now coming in at the rate of 23,000 a year—and to cut into a backlog of undecided cases that currently stands at 1,400.

This week, NLRB Chairman Frank McCulloch is expected to unveil the Board's proposals in hearings before a House labor subcommittee. The subcommittee, headed by Rep. Roman Pucinski (D., Ill.) is midway in an investigation of NLRB processes and the reasons for Board delay in handling cases.

At the current rate, it usually takes more than a year for the Board to decide whether charges filed by unions and employers are justified. Frequently, before the Board finally acts, the aggrieved party has lost out. Often the union has lost its leverage in an organizing drive, or the employer has been irreparably damaged by a strike that is eventually determined to be illegal.

Both labor leaders and employers—but mostly on the union side—have complained against the slow Board processes. Actually the McCulloch Board's program is patterned after recommendations made by a six-man panel of management and labor attorneys earlier this year.

The Board's proposals, which would need congressional approval, are expected to receive support from President Kennedy and become part of his reorganization proposals for federal agencies.

In the construction industry, union officials are backing the proposal. They complain that because of the relatively fast turn around on construction projects, the issue in a Board case is moot before the Board acts. For contractors, however, who are most often involved in secondary boycott actions by unions, the Taft-Hartley law requires the Board to seek an immediate injunction against the union action. Thus, the union is at least held up until the Board finally rules.

The Board's case-handling plight was revealed at the Pucinski subcommittee hearings by its executive secretary, Ogden Fields. He noted the "unprecedented" increases in cases coming before the Board, which averaged until this year some 13,000 annually. Although the Board is turning out more decisions than ever, its backlog is still rising. "This is not a bright picture," said Mr. Fields. "No amount of diligence by the Board members can hope to compete with the ever-increasing demands of the work load," he added.

And Mr. McCulloch has said: "After two months in office we are further behind, in spite of hard work."

Union officials testifying at the hearing complained that Board delay has caused injustices to their cause. William Pollock, president of the textile workers union, charged that employers, particularly in the South, effectively and illegally resisted union organizing drives and his union was unable to get legal recourse before the labor agency because of the delay.

William Barton, labor relations expert for the Chamber of Commerce, also said a "radical change" is necessary because of the "delay in administering justice." However, Mr. Barton proposed that the Board delegate more cases to the states rather than turning them over to trial examiners for solution. If this doesn't work, he said, "the Board should be abolished."

Earlier this month, the NLRB took its first steps to speed up part of its operations. Under authority provided in the 1959 Landrum-Griffin law, the agency turned over the processing of union representation cases to the NLRB's 28 regional offices. The regional directors can now set the dates for such elections where the workers decide whether they want to be represented by a union, or to have their union decertified. They can determine appropriate units and issue certifications. Decisions can be appealed to the Board.

Unemployment Costs May Mount

The need for new ideas in worker training programs and in the sharing of unemployment costs was suggested by developments on two fronts earlier this month.

The U. S. Labor Department reported a decline in unemployment but an increase in long-term unemployment, indicating, it said, that "we are not eating into structural unemployment" despite the signs of a business pickup.

At the same time, the President's Labor-Management Advisory Committee, meeting for the second time, called the unemployment problem "intolerable," cited the need for "broad, new retraining programs," and urged serious study of new approaches to the problem through collective bargaining and government action.

The structurally unemployed include those whose skills have not kept abreast of technological developments, as well as those displaced by automation, plant relocations and shifts in consumer demands.

The Labor Department reported that unemployment had dropped by 533,000—which was described as seasonal—to 4,962,000 by mid-April, putting the seasonally adjusted rate of unemployment at 6.8%. It was 6.9% in mid-March. The number of workers out of jobs for 15 weeks or longer, however, rose to 2.1 million—which is a postwar high.

The government, according to Labor Secretary Arthur Goldberg, is already considering proposed changes in the unemployment compensation system to provide retraining and relocation benefits to the unemployed. Meanwhile, Walter Reuther hopes to break new ground on management's responsibility for unemployment during the auto industry's collective bargaining sessions this summer.

Builders Aim at Uniform Rates

New Jersey contractors progress on standardization of wages. New York shutdown continues.

Building contractors in New Jersey are moving closer to some of their labor contract goals. But in upstate New York, contractors have taken a $40-million shutdown in an effort to achieve some of theirs.

The New Jersey employers have obtained common expiration dates in many of their contracts with carpenters, laborers and bricklayers in nine northern counties. And they have worked out wage increases that will help eliminate area wage differentials that have existed between locals of the same trade.

The cost of the new contracts to members of the Building Contractors Association of New Jersey, however, is running relatively high. Increases in wages alone range from 15 cents an hour in one-year contracts to 75 cents in a three-year pact.

The one break that occurred last week in the eastern New York stalemate produced a cheaper settlement—12½ cents a year in a two-year contract. The contract covers laborers in Troy, Schenectady and Albany. It is the first area-wide agreement for the local unions.

But the settlement had no effect on the general shutdown which centers around a strike by operating engineers.

A spokesman for Eastern New York Construction Employers, Inc., said two basic issues are involved with the engineers:

- Contractors are insisting on elimination of pushbutton and other "featherbedding" provisions, such as those that call for the assignment of engineers to tasks that have been "automated" out of existence.
- Contractors are seeking a new hiring hall clause with provisions specifically designed to end present referral practices that are "clearly illegal" and "closed shop" in nature.

The engineers picketed all jobs on a "hit and run" basis, the employer spokesman said. And the contractors shut down when they could no longer operate economically. This brought a halt on May 1 to substantially all industrial, commercial and institutional work in 10 eastern New York counties. The engineers' picketing from north of Glens Falls to the Canadian border was not effective and work in that area was not shut down.

The eastern New York employers are still negotiating with the plumbers, who also struck, and with 10 other trades that did not strike.

Of the settlements in northern New Jersey, the biggest one went to Morristown bricklayers, who are now assured of a $5.15 scale by May 1, 1963.

The bricklayers—Local 21—received a 20-cent increase retroactive to May 1 and will get another 10 cents on November 1. They will receive 25 cents more next May 1 and another 20 cents May 1, 1963 making a total of 75 cents.

The New Jersey progress toward wage stabilization is particularly apparent in the carpenters' contracts. Carpenter rates in six counties, for example, will be uniform at $4.70 by May 1, 1963. And carpenter fringes will also be standardized in six counties—15 cents for health and welfare and 10 cents for pensions.

The New Jersey contractors also have made further inroads on the elimination of the percentage method of computing fringe benefits. And in some cases they have negotiated a broader contractor stipulation for sending jurisdictional disputes to the National Joint Board. The stipulations in the Bergen County carpenters and laborers agreements, for example, apply to subcontractors under the general contractor's control.

Among the new settlements in New Jersey are these:

- Laborers in Bergen County: A three-year contract raises wages by 45 cents in three installments (15, 15, 15). First installment yields a new scale of $3.35. A five-cent increase in welfare payments raises these to 15 cents the first year. A five-cent boost in the pension contribution will raise the present 10-cent payment to 15 cents the third year.
- Carpenters in Passaic County: A three-year pact adds 52 cents to wages in three installments (20, 15, 17). Fringes remain at 15 cents for health and welfare, 10 cents for pensions. New scale after the first wage boost is $4.38. (Passaic bricklayers, who were getting $4.45, settled for 60 cents in a three-year contract. Annual installments are 15, 20 and 25).
- Bricklayers in Mercer County (Princeton): A two-year contract boosts wages 25 cents this year and 15 cents next year, for a total of 40 cents. New rate, effective May 1, 1961, was $4.60.

Labor in Brief . . .

- **Scholarship**—The bricklayers' first award of a Harry C. Bates Merit Scholarship has been made to James W. Oates, a California high school student who plans to study engineering and become a contractor.
- **Back to work**—New three-year labor contracts have ended strikes in Columbus, Ohio, by operating engineers and carpenters. Engineers won 42½ cents in three steps (12½, 15, 15). Carpenters received a nine-cent boost this year.
- **No-strike clause**—A new labor agreement for the Yellowtail Dam—a Bureau of Reclamation irrigation project near Hardin, Mont.—contains a no-strike clause. Disputes will be referred to a joint union-contractor board. If that fails, an arbitrator will take over.
- **Jurisdiction**—The $5.5-million Federal Building project in Little Rock, Ark., has been hit by a jurisdictional dispute between carpenters and lathers over installation of metal studs for movable, interior walls.
- **Apprenticeship**—The 17th Eastern Seaboard Apprenticeship Conference will be held June 5-8 in Manchester, Vt. Panel discussions will include apprenticeship training problems in the construction industry. The eight-state conference is expected to attract leaders in industry, labor and government.
- **A stitch in time?**—The Illinois State Council of Sheet Metal Workers has urged its locals to have their Joint Apprenticeship Committees include in their training programs lessons in the proper use of substitute materials, such as plastics and fiberglass. At stake is protection of the union's jurisdiction.
- **Pickets withdrawn**—Operating engineers Local 542 has ended a 22-day strike at General Electric's $30-million space laboratory project near King of Prussia, Pa. Under a truce worked out with federal mediators and project contractors, the issues in dispute will be included in local contract negotiations. The engineers have engaged in selective strikes.

For Labor Peace

Sheet metal workers urge use of adjustment boards

The Sheet Metal Workers' International Association is continuing its efforts to promote local-level settlement of labor disputes between its members and their employers without strikes.

Speaking in Chicago at the 1961 annual conference of the Illinois State Council of Sheet Metal Workers, David S. Turner, the union's general secretary-treasurer, urged local unions to set up dispute-adjustment boards with employers.

Working at the national level, the union and the Sheet Metal and Air Conditioning Contractors' National Association have established a National Joint Adjustment Board. The board is the final appeals machinery in a fairly elaborate grievance procedure recommended by the two groups. Local boards are the first formal steps.

Mr. Turner's major selling point is that the welfare and progress of those in the sheet metal industry depend on labor-management cooperation and harmony. Disputes that cause "down time" for employers and loss of income for workers are not good for anyone, according to Mr. Turner. He would like to see local boards operate on a continuing basis, eliminating "friction points" and forestalling disputes.

Specifically, Mr. Turner is trying to sell local sheet metal worker unions on Article X of the union's standard form of agreement. That calls for settling disputes over contract interpretation or enforcement in this fashion:

- On the spot settlement, if possible, by the contractor and the union.
- Referral of the dispute, if the first step fails, to the Local Joint Adjustment Board.
- An appeal to a special two-man panel if the local board fails. The panel would consist of a representative chosen by the international union and a representative selected by the contractor in the dispute.
- The final step, if the panel deadlocks, is an appeal to the National Joint Adjustment Board.

Strikes and lockouts are banned during the processing of disputes.

Mr. Turner sees little reason why disputes should not be settled early in the game. The biggest step, he says, is reaching agreement on the facts in a dispute—and the easiest place to do this is at the local level. "The farther away the machinery for the settlement is," he warns, "the more difficult it becomes to get at the real facts."

OFFICIAL PROPOSALS

RATE: The rate for official Proposal advertising is $2.70 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.
SEND COPY TO: Official Proposal Division, Engineering News-Record
Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

Bids: June 7, 1961

State of Delaware
Delaware State Highway Department
Notice to Contractors

Sealed proposals will be received by the State Highway Department of the State of Delaware until 2:00 P.M. (E.D.S.T.) June 7, 1961, for the following contracts: CONTRACT I-1(21)-1, FEDERAL-AID PROJECTS I-95-1(11) AND I-95-1(18), BASIN ROAD INTERCHANGE, New Castle County. Stabilize, grade, construct 2 major bridge structures 9" Reinf. Conc. Paving and Adjustments to Gas & Water Utilities. (Completion Time 450 Calendar Days). The principal work items are: 550,000 C.Y. Borrow; 6,000 C.Y. Portland Cem. Conc. Pavement; 2,548 C.Y. Portland Cem. Conc. Masonry; 826,000 Lbs. Structural Steel (Approx. Weight); 14,000 L.F. Cast-in-Place Conc. Piles; 370,000 C.Y. Swamp Excavation; 480,000 C.Y. Special Fill. CONTRACT I-1(23), FEDERAL-AID PROJECT I-95-1(15), STABILIZE SOUTH PORTION OF CHRISTINA INTERCHANGE, New Castle County. Excavating Unsuitable Material and Backfilling to Elevation 5.5'. (Completion Time 600 Calendar Days). The principal work items are: 455,000 C.Y. Channel Excavation; 32,000 C.Y. Borrow; 2,150,000 C.Y. Swamp Excavation; 2,750,000 C.Y. Special Fill. CONTRACT I-1(24), FEDERAL-AID PROJECT I-95-1(16), STABILIZE NORTH PORTION OF CHRISTINA INTERCHANGE, New Castle County. Stabilization by use of Sand Drains and Excavation and Backfilling to Elevation 5.5'. (Completion Time 600 Calendar Days). The principal work items are: 1,850,000 C.Y. Borrow; 1,250,000 C.Y. Swamp Excavation, 1,650,000 C.Y. Special Fill; 775,000 L.F. Sand Drains; 160,000 C.Y. Sand Blanket. The Department will also accept bids for a COMBINATION PROJECT which includes all the work contemplated under each of the above listed individual contracts. The Completion Time for the Combination Project is 750 Calendar Days. The major work items for the Combination Project would be: 472,000 C.Y. Channel Excavation; 2,432,000 C.Y. Borrow; 5,828 C.Y. Portland Cem. Conc. Masonry; 3,770,000 C.Y. Swamp Excavation; 4,880,000 C.Y. Special Fill; 775,000 L.F. Sand Drains; 160,000 C.Y. Sand Blanket. PREQUALIFICATION HAS BEEN WAIVED FOR THESE CONTRACTS. Prospective bidders may obtain contract documents from the Highway Department office, Third Floor, Administration Building, Dover, Delaware. Delaware State Highway Department, By: J. Gordon Smith, Chairman, William J. Miller, Jr., Acting Chief Engineer, May 10, 1961, Dover, Delaware.

District of Columbia—Highway Construction—Dept. of Highways & Traffic, D. C., May 1, 1961. SOUTHEAST FREEWAY CAPITOL SUBSTATION, FEDERAL AID INTERSTATE PROJECT NO. I-695-3(5)2, Invitation No. C-6146-H, consisting of 960 cu. yds. Concrete Masonry and 187,000 lbs. Structural Steel (Wage rates have been predetermined by Labor Dept.) Bid forms, plans and specifications are now available from Supervisor, Bid & Contract Division, Procurement Office, D. C., Room 404, 499 Penn. Ave., N.W., upon deposit of a certified check for $20.00 per set, payable to D. C. Treasurer (Phone NA 8-6000, Ext. 2378). SEALED BIDS to be opened 3:00 PM, EDT, June 6, 1961, in Room 424, 499 Penn. Ave., N.W.

Bids: June 13, 1961

City of Chattanooga, Tennessee

BRAINERD SEWAGE
TREATMENT PLANT ADDITIONS
Contract 24

Sealed proposals will be received by the City of Chattanooga, Tennessee, at the office of the Commissioner of Public Works, Room 204, City Hall, until 2:00 o'clock on Tuesday, the 13th day of June, 1961, at which time and place proposals will be publicly opened and read for:

Brainerd Sewage Treatment Plant Additions, Contract 24, covering the construction of a new wet well, detritor, settling tanks, aeration tanks, sludge digestion tanks, sludge disposal and blower facilities and remodeling of existing structures to chlorine contact tanks, chlorine storage, and elutriation tanks.

Copies of the plans and specifications may be examined at the City Engineer's office, Room 205, City Hall, Chattanooga, Tennessee, or the offices of Havens and Emerson, Room 2701, Woolworth Building, 233 Broadway, New York, N. Y., or 640 Leader Building, Cleveland, Ohio, after May 13, 1961.

Plans, Specifications, and Proposal Forms may be obtained at the office of the City Engineer, Room 205, City Hall, Chattanooga, Tennessee.

A deposit of forty dollars ($40.00) will be required for each set of plans and specifications taken from the above office. The entire deposit will be refunded if a formal bid is submitted to the City and the plans and specifications are returned in good condition within fifteen (15) days after receipt of bids. Where no bid is submitted and the plans and specifications are returned on or before the date hereinbefore specified, only one-half of the deposit shall be refunded. After said date no plans and specifications will be redeemed and the entire deposit shall be forfeited.

Extra copies of plans or specifications may be obtained at the cost of twenty dollars each, which sums will not be refunded. Extra plan sheets may be obtained at the cost of one dollar each which sum will not be refunded.

Each bid must be accompanied by cash, certified check or cashier's check to the order of the City of Chattanooga, Tennessee, in an amount equal to not less than five percent of the total amount of the bid; and a bid letter from a surety company licensed to conduct business in the State of Tennessee, engaging to furnish a performance bond upon the award of contract.

All bidders must be licensed contractors as required by Chapter 135 of the Public Acts of 1945 of the General Assembly of the State of Tennessee and all Acts amendatory thereof. Bidder's name, address and license number must be placed on the sealed envelope containing these documents, and the envelope shall be plainly marked "Bid on Contract 24."

All bids must be made out on the proposal form bound in the specifications. No interlineations, additions, or deletions shall be made in the proposal form by the bidder.

Bids will not be received after the time specified for the opening of bids. Bids submitted after the hour appointed will be deemed invalid and returned unopened to the bidder.

The City of Chattanooga, through its Board of Commissioners, reserves the right to reject any and/or all bids, to waive any informalities in the bids received, and to accept any bid which in its opinion, may be for the best interest of the City.

Pat Wilcox, Commissioner
Department of Public Works,
Streets & Airport

OFFICIAL PROPOSALS

Bids: July 17, 1961

Republica De Nicaragua
Empresa Nacional de Luz y Fuerza
—Managua

INVITATION TO BIDDERS
HYDROELECTRIC SYSTEM TMV—
FIRST STAGE

Date: May 25, 1961.

The Empresa Nacional de Luz y Fuerza, an autonomous entity of the state, Republic of Nicaragua announces that having obtained financing from the International Bank for Reconstruction and Development and from the Development Loan Fund for the construction of the first stage of the Tuma-Matagalpa-Viejo Hydroelectric System, will receive sealed bids addressed to the Construction Management of the same entity for the construction of the works described here on, until the 15 hours of the 17 of July of 1961.

Contract No. TMV-Ia 2
Project: TMV System—First Stage
Work: Operators' Village

Bids will be publicly opened and read aloud by the Construction Management of the Empresa Nacional de Luz y Fuerza in Managua at the 15 hours of the 17 of July of 1961.

Copies of the Contract Documents, plans and specifications may be examined and obtained upon the payment of Cs 350 or U.S.$ 50 at the Empresa Nacional de Luz y Fuerza (Construction Management) Managua, Nicaragua. Contract Documents, plans, specifications and general information may be examined at the Empresa Nacional de Luz y Fuerza (Construction Management) Managua, Nicaragua.

The said work consists of the following:
Location: Work situated 20 kilometers N.W. of the city of Jinotega, Department of Jinotega

Description:
Residential Houses: it is a group of nine single stage houses, with reinforced concrete frame, masonry walls and wood deck, complete of sanitary and electrical services.

Utilities: includes an aqueduct with 2½" G.I. pipe, pumping and filtration plant; a sanitary sewer with 8" concrete pipe and septic tanks; an electrical generating system with two 40 kWA diesel generators and distribution line.

Bids: June 27, 1961

Niagara Falls Bridge Commission
Lewiston-Queenston Bridge Project
United States and Canada

Sealed bids covering Contract No. 5 of the Lewiston-Queenston Bridge Project will be received by the Niagara Falls Bridge Commission at its offices in Niagara Falls, New York, until 4:00 P.M., Eastern Daylight Time, June 27, 1961.

This contract is entirely in the United States and provides for the construction of a Terminal and approaches to the Lewiston-Queenston Bridge now under construction. The work will include construction of embankment, paving, drainage, roads, buildings, Pedestrian, Toll, Customs and Immigration facilities, except certain landscaping which will be done under subsequent contracts, and other related work. Certain electrical equipment of Canadian manufacture will be delivered, duty paid, to the successful bidder for incorporation into the work of this Contract.

The work on Contract No. 5 is to be completed on or before May 15, 1962.
Plans, Specifications, and Bid Forms may be seen at the office of the Niagara Falls Bridge Commission, Niagara Falls, New York, and at the offices of Hardesty & Hanover, Consulting Engineers, 101 Park Avenue, New York 17, New York.

Copies of these documents may be secured at said offices by the deposit of $50.00 per set, $30.00 of which will be refunded upon the return of each set in good condition within one week after award of the contract.

A bid deposit in the form of a certified check for not less than five percent (5%) of the gross bid shall accompany each bid submitted.

Niagara Falls Bridge Commission
C. Ellison Kaumeyer
General Manager

Bids: May 31, 1961

The Port of New York Authority

TETERBORO AIRPORT
SANITARY SEWER CONNECTIONS
CONTRACT O & M 524

Sealed proposals for the construction of Sanitary Sewer Connections at Teterboro Airport will be received at the office of the Department of Purchase and Administrative Services of The Port of New York Authority, Room 900, 111 Eighth Avenue, New York 11, New York, until 11:00 A.M. o'clock Wednesday, May 31, 1961, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Department of Purchase and Administrative Services, Room 900, and copies will be furnished upon deposit of $10.00 per set. Deposit must be delivered to Treasury Department, Room 1001, where a receipt will be issued. The receipt is then to be delivered to the Department of Purchase and Administrative Services, who will furnish the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than thirty days after the opening of Proposals. The deposit will be forfeited if the documents are not returned within thirty days.

THE PORT OF NEW YORK AUTHORITY
S. Sloan Colt, Chairman

New York

U. S. Government

Sealed bids from Small Business Concerns for alterations for data processing center, Treasury Disbursing Office, at 5000 Wissahickon Avenue, Philadelphia, Pa., Project No. 00935, will be received until 2:00 P.M., E.D.S.T., June 13, 1961, and then publicly opened. Bidding material may be obtained from the Business Service Center, General Services Administration, 250 Hudson Street, New York 13, N. Y., from the Custodian of the building where the work is to be done, or from the Chief, Philadelphia Field Office, Design & Construction Division, U. S. Custom House & Appraisers Stores, 2nd & Chestnut Streets, Philadelphia 6, Pa.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5602) will be received at Weslaco, Texas, until 10 a.m., Central Standard Time, June 20, 1961, for furnishing labor and materials for Clearing, Earthwork, Concrete Lining and Structures for Rehabilitation of B and D Lateral Systems, Mercedes Division, Texas, Lower Rio Grande Rehabilitation Project. Location Weslaco, Texas. Principal items are 270,400 cu. yds.—constructing embankments; 4,400 cu. yds.—concrete; 2,584 lin. ft.—furnishing and laying 60-inch diameter, class III, concrete culvert pipe with rubber gasket joints; and other work. Completion time 820 days. For particulars, address Bureau of Reclamation, P. O. Box 1609, Amarillo, Texas; P. O. Box 357, Weslaco, Texas; or Building 53, Denver Federal Center, Denver 25, Colorado. Floyd E. Dominy, Commissioner.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Invitation No. DS-5601) will be received at Denver, Colorado, until 2 p.m., Mountain Standard Time, June 21, 1961, for furnishing eight (8) hydraulic hoists for 13.96-foot by 22.45-foot fixed-wheel gates for Glen Canyon Dam and Powerplant, Colorado River Storage Project, Arizona-Utah. Delivery is desired within 450 days. For particulars, address Bureau of Reclamation, Building 53, Denver Federal Center, Denver 25, Colorado. Floyd E. Dominy, Commissioner.

Contractors Watch This Section—

for new projects. Publish your announcements through the proposal sections of *Engineering News-Record* and get their bids.

Bids: June 22, 1961

The Port of New York Authority

Sealed proposals for the following work will be received at the Office of the Chief Engineer, Room 1100, 111 Eighth Avenue, New York 11, New York, until 2:30 P.M. on date indicated, at which time said proposals will be opened and read in Room 1108.

Contract NYA-590.010—New York International Airport—Cargo Buildings 86 and 87—Deposit $30.00 per set of documents—Bids will be received until 2:30 P.M. on Thursday, June 22, 1961.

Contract NYA-590.011—New York International Airport—Cargo Buildings Nos. 86 and 87—Paving and Utilities—Deposit $30.00 per set of documents—Bids will be received until 2:30 P.M. on Thursday, June 22, 1961.

Contract NYA-220.021—New York International Airport—Runway 13R-31L—Holding Pad and Taxiway—Deposit $30.00 per set of documents—Bids will be received until 2:30 P.M. on Thursday, June 22, 1961.

Contract documents may be seen at the Office of the Assistant Chief Engineer for Design, Room 1115, 111 Eighth Avenue, New York 11, N. Y. Documents will be furnished upon receipt of the above deposit (each set including one copy of the Contract Drawings) for not more than three sets to any one company. Additional sets will be furnished upon payment of an amount for each set equal to the deposit indicated above, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract directly to the Authority will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
S. Sloan Colt, Chairman

New York, May 25, 1961

CLASSIFIED ADVERTISING INDEX

Albert Pipe Supply Co.	87
Ambursen Dam Co., Inc.	87
Associated Pipe & Fitting Co., Inc.	87
Buff	87
Conmaco Inc.	87
Foster Co., L. B.	87
Gillis & Co.	87
Golden, R. D.	87
Greenpoint Pipe Supply Corp.	87
MacCabee, Campbell & Associates	85
McGraw-Hill Publishing Co.	85
McKee & Co., Arthur G.	85
Memphis Equipment Co.	87
Midwest Steel Corp.	87
National Schools of Construction	86
Pennsylvania Dept. of Highways	85
Sanford Bros. Marine Contractors, Inc.	86
Seaboard Steel Piling	87
Stanhope Inc., R. C.	87
Sun Oil Co.	85
Swabb Equipment Co., Inc., Frank	87
Telephone Engineering Co.	86
Warren-Knight Co.	87
Wenzel Machinery Co.	87
Western Services Corp.	87
Whisler Equipment Co.	87
Whisler Steel Piling Co.	87
Wilson Engineering Corp.	86

The Pennsylvania Department of Highways Seeks

BRIDGE DESIGNERS & DETAILERS

with experience or recent M.S. graduates.

• Starting Salaries from $4,500 to $9,000 • Permanent Positions
• Challenging Opportunities • Growth Potential • Fringe Benefits

For applications, write prior to June 12 to

RECRUITMENT SECTION, ROOM #418, N. O. BLDG., HARRISBURG, PA.

REPRESENTATIVES or DISTRIBUTORS for STRUCTURAL STEEL PRODUCTS

Fabricator of unique line of stock-designed structural steel products seeks aggressive representative immediately for Central and Atlantic areas, excluding Pa., Del., N. J. and New England. Will also consider representatives for other sections of country. To contact architects, structural engineers, contractors, builders, etc. Should have own qualified estimators, detailers, draftsmen, and erectors available. Product advertisements draw tremendous response from all over the world, and initial leads will be furnished.

Write RW-6684, Engineering News-Record Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

DESIGNERS — SURVEYORS

Highway and Bridge Designers. Minimum 8 years exp. Registered Land Surveyors for Illinois. Usual benefits—permanent.

MACCABEE, CAMPBELL & Assocs.
173 W. Madison St. Chicago 2, Ill.

ADDRESS BOX NO. REPLIES TO: Box No. Classified Adv. Div. of this publication. Send to office nearest you.
NEW YORK 36: P. O. Box 12
CHICAGO 11: 645 N. Michigan Ave.
SAN FRANCISCO 11: 255 California St.

• POSITIONS VACANT

Structural Engineer-Midwest consulting firm seeks Ph.D. to design complex steel structures, reinforced and prestressed concrete. Preference will be given to applicants with practical experience. Permanent position with established firm in business since 1929. Moving expenses paid. Send resume, including education, experience, and personal qualifications to P-6245. Engineering News-Record.

Estimator-Engineer. Permanent position for man with experience in slip-form construction, both in the field and in cost estimating. Capable of take-off and pricing from preliminary and working drawings. Salary in line with background and experience. Engineering degree or registration is not a requisite. P-6637, Engineering News-Record.

Wanted—Competent and experienced Engineers on water works, water treatment, sewers and sewage treatment. State experience, salary required and when can report. P-6666, Engineering News-Record.

Traffic Engineer, City of Sioux City, Iowa. Population 90,000. College graduate—special training and experience in traffic engineering. Beginning salary $700. Reports directly to City Manager. Apply—Director, Personnel, City Hall, Sioux City, Iowa.

Sanitary Engineer to organize and supervise short courses for operators and engineers. Academic rank. Write: R. E. McCord, 231 Sackett Bldg. The Pennsylvania State University, University Park, Pa.

DON'T FORGET

the box number when answering advertisements. It is the only way we can identify the advertiser to whom you are writing.

McKEE

continues to offer excellent opportunities to men qualified by experience as project engineers, instrumentation engineers and estimators in the oil refining, petrochemical and chemical design and construction field. If you are considering changing employment, change *with confidence.*

Send detailed resume and photo to:

G. VICTOR HOPKINS

ARTHUR G. McKEE & CO.

2300 Chester Ave. Cleveland 1, Ohio

GRADUATE ENGINEER

Creative, practical, graduate engineer is required by corporate staff engineering department of a national company located in Rockefeller Center, New York. Must have at least 5 years experience in design and development, light and heavy apparatus and fabricating equipment. Experience in manufacturing methods and processes in plastics or rubber helpful but not required. Must be willing to travel. Submit complete resume with college transcript and salary requirements to box .

P-6693, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

• POSITIONS VACANT

Steam Power Plant Design Engineer—Minimum 5 years responsible experience, including supervision of personnel, in design of steam power plants. Progressive consulting engineering firm offers permanent employment with opportunity for personal development and advancement potential. Submit resume and salary requirements to Stanley Engineering Company, Muscatine, Iowa.

Electrical Engineer—Experienced in design of electric transmission, distribution and substation facilities. Progressive consulting engineering firm offers permanent employment with opportunity for personal development and advancement potential. Submit resume and salary requirements to Stanley Engineering Company, Muscatine, Iowa.

Sanitary Engineer with extensive experience in preliminary engineering and design of sanitary projects. Submit complete resume of education, experience and qualifications, together with salary requirements. Stanley Engineering Company, Hershey Building, Muscatine, Iowa.

Draftsmen, Structural-Experienced, Checkers and detailers of structural steel shop dwgs. Relocation expenses. Fink & Zwecker Co., 1100 Crescent Ave., N. E., Atlanta 9, Ga.

Water Works Engineer—Graduate engineer 5-10 years experience design, construction, testing distribution systems. Permanent employment water works management company. Philadelphia, Pa. Reply P-6767, Engineering News-Record.

(Continued on the following page)

ME's, CHEM E's, EE's plus CIVILS

When you think of INTEREST think of your job

When you think of GROWTH think of your job

When you think of CHALLENGE think of your job

When you think of your job think of McGraw-Hill

If you like to write, and engineering is your profession, consult with us about a career in engineering-journalism. For additional information, write: Mr. Jack Coyne, Room 506, McGraw-Hill Publishing Company, 330 West 42nd Street, New York 36, New York.

SUNOCO **COST ENGINEER**

A Challenging Position In:

- Budget and definitive estimating
- Bid evaluation
- Contract negotiation

Background Required:

- A Mechanical or Chemical Engineering degree
- At least 5 years related experience in oil or chemical industry

LOCATION—Philadelphia
Outstanding Benefits
Salary—Open

Depending on Individual experience & potential

Send Resume To

Robert A. Matteson

SUN OIL COMPANY

1608 Walnut St., Phila. 3, Pa.

HIGHWAY PLANNING ENGINEERS

For Overseas Employment

Experienced highway engineers with at least ten years experience, preferably a portion of it with a state highway planning survey department. Send complete resume, photograph and present salary to

P-6723, Engineering News-Record
Class Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

• POSITIONS VACANT
(Continued from preceding page)

Painting Estimator of buildings and structures. Thorough—accurate—sales personality. Top Philadelphia organization. Replies confidential. Write complete resume and starting salary. P-6741, Engineering News-Record.

Overseas Employment—Electrical Construction job in Liberia, West Africa. Young engineer with transmission and distribution experience. Material take-off, Material inventory, and distribution staking sheet summaries. Present contract should terminate approximately 4 months. Salary $300.00 week. Schulman-Hatfield-Marson-Gens, 2416 South Michigan Avenue, Chicago 16, Illinois, Phone: CAlumet 5-3206.

Engineer with Gunite Experience for Midwest territory. Must be capable of estimating all types work. Send resume and references P-6760, Engineering News-Record.

Assistant Township Engineer—Township of Woodbridge, New Jersey, population 78,000, is receiving applications for the position of Assistant Township Engineer. Work includes the development of engineering for municipal projects, such as roads, sewers, storm drains and other Public Works projects. Training and experience required; two years Public Works Engineering and a Civil Engineering Degree. Salary open. For information contact Carl F. Wheeler, Township Engineer, 1 Main Street, Woodbridge, N. J.

Draftsman—experienced structural steel detailer and checker. Permanent position with established consulting firm. Fringe benefits. Submit resume of experience, references and salary expected. Samborn, Steketee, Otis and Evans, Libbey-Owens Ford Building, Toledo 2, Ohio.

Bridge Engineer and Junior Structural Engineers—Positions open in Southern Connecticut firm. Send complete resume on experience, references, salary requirements and availability to P-6554, Engineering News-Record.

The City of Minot, North Dakota requires a construction engineer. Must have four year civil engineering degree. Starting salary $450 to $575. Complete details by writing to City Engineer, Minot, North Dakota or R. E. Barcus, City Auditor.

Sewer Foreman experienced in sheeting. Excellent salary. Central Jersey area. Submit resume giving experience. P-6769, Engineering News-Record.

• EMPLOYMENT SERVICES

200-1,000 new positions reported monthly. Get free copy. National Employment Reports, 20 E. Jackson, 902-B, Chicago 4.

• POSITIONS WANTED

B.S.C.E., P.E., 32, 6 years exp. inspection, storm sewers, highways. Desires position West, Southwest. PW-6299, Engineering News-Record.

Construction Supt.—31 years experience all phases Bldg. Construction. Will relocate, Midwest preferred. PW-6618, Engineering News-Record.

General Contractors' Superintendent—age 43 —experienced power plants, sewerage plants, industrial. Prefer Illinois-Indiana location. Will relocate to suit. A-1 references. Reply to PW-6706, Engineering News-Record.

Construction Manager: 13 years chemical, textile & industrial experience. BS and MS Civil Engineering. Professional Engineer NY & Delaware. Will relocate in N. E. US. PW-6707, Engineering News-Record.

Materials Engineer, soils, concrete, asphalt. 11 years experience as supervisor. Have worked for contractors and consultants in U.S. and overseas. PW-6694, Engineering News-Record.

Construction Executive: age 44; twenty-three year background. All phases of industrial, commercial, and institutional construction. Bids to completion, contract negotiation, construction management, cost accounting, and financing analysis. Presently employed. Desire change and connection with young, growing, aggressive organization with possible future participation. Would also consider old line established company in management or branch management capacity. Minimum $18,000 annually. References. PW-6685, Engineering News-Record.

• POSITIONS WANTED

Dirt Foreman, age 34, have 10 years varied const. exp., grading, surveys, inspection, office. Prefer Calif. S.W., OK, PW-6698, Engineering News-Record.

BSCE, MSCE+, PE, RLS, age 33—Varied experience in design, maintenance and construction. Min. $9600. Resume on request. PW-6679, Engineering News-Record.

Superintendent—Experienced in excess of forty completed contracts for highway and heavy earth moving, bridges. Complete project planning and execution. Will relocate. Reply PW-6727, Engineering News-Record.

Structural Engineer, Graduate C.E., 36, 10 years design exp. in conc. and steel for industrial structures. Desire position Westcoast, West. PW-6729, Engineering News-Record.

Construction Superintendent—Institutional— Public Works, hospitals. New work and alterations. PW-6733, Engineering News-Record.

CE—Structural M.S., P.E. Exp. bridge constr. design. Desires position West. PW-6737, Engineering News-Record.

B.S. Arch. Engr., P.E., 34, 11 years comprehensive experience in all phases industrial and commercial construction, architectural and structural design. Desires responsible position with potential. PW-6738, Engineering News-Record.

• POSITIONS WANTED

Construction Manager—Good record as successful field manager. Twenty years experience building construction supt., project manager, general supt. with top grade contractors. Engineering background. Presently employed. Profit sharing connection desired. PW-6608, Engineering News-Record.

Canadian Engineer, 35, ten years experience primarily in Municipal Engineering desires position with future in U.S.A. or Canada. Reply PW-6748, Engineering News-Record.

Administrative Manager with complete responsibility for personal government relations and fiscal policy. Fifteen years heavy construction including ten years in near and middle East. Available now for same type of position domestic or overseas. Resume on request. PW-6749, Engineering News-Record.

Construction Engineer. Registered. 35 years all phases, preliminary design to construction, water supply, sewage treatment, bridges, tunnels, foundations and other heavy construction. Know construction methods and control. Available for supervision project construction. PW-6768, Engineering News-Record.

DON'T FORGET

the box number when answering advertisements. It is the only way we can identify the advertiser to whom you are writing.

SEARCHLIGHT SECTION
CLASSIFIED ADVERTISING

BUSINESS OPPORTUNITIES - EQUIPMENT - USED or RESALE

DISPLAYED RATES

The advertising rate is $25.50 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

AN ADVERTISING INCH is measured 7/8 inch vert. on one col., 3 columns—30 in. to a page.

EQUIPMENT WANTED or FOR SALE ADVERTISEMENTS acceptable only in Displayed Style.

UNDISPLAYED RATES

$2.70 a line, min. 3 lines. To figure advance payment count 5 average words as a line.

BOX NUMBERS count as one additional line in undisplayed ads.

DISCOUNT OF 10% if full payment is made in advance for four consecutive insertions of undisplayed ads.

CONSTRUCTION SUPERVISION

Exclusive Training Course by mail for top positions. Publishers Manual of Advanced Construction Management. Send postcard for details.

National Schools of Construction
Est. 1952
Satsuma, Florida

ADDRESS BOX NO. REPLIES TO: Box No. Classified Adv. Div. of this publication. Send to office nearest you.
NEW YORK 36: P. O. Box 12
CHICAGO 11: 645 N. Michigan Ave.
SAN FRANCISCO 11: 255 California St.

• BUSINESS OPPORTUNITIES

Land Surveying & Consulting Engineering Company for sale or merger-controlling interest in well established organization, excellent reputation, large volume business in land surveys and subdivision engineering in large mid-continent city—owner wishes to retire. Identify yourself completely in your inquiry with experience noted in subdivision engineering. Engineer must be P.E. BO-6656, Engineering News-Record.

Opportunity To Purchase Established Civil Engineering firm in Florida Gold Coast Area. Reasonable terms to qualified and financially responsible principals. Current clientele substantial with exceptionally bright future. Adequate orientation period by present owners. BO-6662, Engineering News-Record.

DON'T FORGET

the box number when answering advertisements. It is the only way we can identify the advertiser to whom you are writing.

STRUCTURAL ENGINEERING
ARCHITECTURAL ENGINEERING
OUR COURSES of instruction by mail HAVE HELPED THOUSANDS to better positions and to pass State Board Examinations. Forty-eighth year.
Write today—without obligation
WILSON *Engineering Corp.*
College House Offices HARVARD SQ., CAMBRIDGE, MASS.

U. S. ARMY EE-8
Telephone fully reconditioned at 2 for $35.00. Any number can be used on same line. Wire 1c per ft. or $35.00 per mile. Write for complete telephone list.
TELEPHONE ENGINEERING CO.
Dept. ENR 5251, Simpson, Pa.

DIVING SERVICE
WORLD WIDE
- SALVAGE
- CONSTRUCTION
- INSPECTION
- BURNING & WELDING
- DEMOLITION
- UNDERWATER T.V. & PHOTOGRAPHY

MAXIMUM INSURANCE COVERAGE

SANFORD BROS., INC.
211 Onstead St. Morgan City, La.
Phone 459-5832

SHOVEL BARGAIN
West Virginia Location
BAY CITY Model 71, 1½ yd shovel s/n 8145, 34" pads, Kohler light plant, New Sept 1956. Machine completely reconditioned and Excellent. Priced $24,500. f.o.b. cars, Charleston, W. Va.
WENZEL MACHY. CO.
565 So. 10th, Kansas City, Ks.

LOW COST INSTALLATION AND OPERATION
CABLEWAYS
IMMEDIATE SHIPMENT
ELECTRIC, STEAM or DIESEL
CAPACITY 3 to 20 TONS
SELL, RENT or BUY
FOR DAMS BRIDGES BREAKWATERS FILTRATION AND SEWERAGE PLANTS
FOR SPEED ECONOMY EFFICIENCY FLOOD SAFETY LABOR REDUCTION
AMBURSEN DAM CO. INC.
295 MADISON AVE. NEW YORK

FOR SALE OR RENT
200 TON AMERICAN MODEL 200-160 GUY DERRICK
50 TON AMERICAN MODEL 3046 STIFFLEG DERRICK
AMERICAN R-15 REVOLVER GANTRY CRANES
200 HP AMERICAN #180 3 DRUM HOIST AND SWINGER
25 TON IND. BH #5 DIESEL LOCOMOTIVE CRANE
45 TON GEN. ELEC. DIESEL ELEC. LOCOS.
25 TON GEN. ELEC. DIESEL ELEC. LOCO.
1 YD. LORAIN L-50 CRANE, NEW 1951.
WHISLER EQUIPMENT CO.
1905 Railway Exchange Bldg., St. Louis 1, Mo.

FOR SALE
Bantam 6 ton Crane
Diesel Power—1957
Condition Excellent
R. D. GOLDEN Troy, N. Y.

RAILS-TIES
TRACK ACCESSORIES

SURVEYING INSTRUMENTS
USED • REBUILT • SALE
RENT • REPAIRING

High Speed in 6x6's
NEW ISSUE TRUCKS
GMC! MACK! REO "Eager Beaver!"
• Tandem Axle • Front Wheel Drive
For specifications, prices, delivery, write
MEMPHIS EQUIPMENT COMPANY
P.O. Box 2852, Dept. E., Memphis, Tenn.
NATION'S LARGEST ARMY TRUCK DEALER!

TRANSITS AND LEVELS

New or Rebuilt
Sale or Rent
Headquarters for REPAIRS — any make — Factory Service. We will also buy your old instruments or take them in trade.
A complete line of Engineering Instruments and equipment for field or office. Write for catalog NRL 205.
WARREN-KNIGHT CO.
Manufacturers of Transits and Levels
136 No. 12th St., Philadelphia 7, Penna.

RAILROAD Cross and Switch **TIES**
Promptly from adequate stocks
NEW and USED *(as available)*
GILLIS & COMPANY
134 Breckenridge Lane Louisville 7, Ky
TW 5-9484

HEAVY EXCAVATION EQUIPMENT
LARGE DRAGLINES, SHOVELS, CRANES, ROTARY DRILLS, EUCLID DUMP TRUCKS
FRANK SWABB EQUIPMENT COMPANY, INC.
Hazleton National Bank Building, Hazleton Pa.
Phone GL 5-3658

PILING
SURPLUS NEW and USED For Sale, Wanted or Rent

ALL MAKES
RE-BUILT REPAIRS RENT REAL EXPERTS
BUFF
69 Dey St., New York WOrth 2-2797

STEEL SHEET PILING
AVAILABLE FOR PROMPT SHIPMENT

Pcs.	Section	Length	Location
130	MP-101	40 to 45 ft.	Indiana
450	MP-116	20 to 60 ft.	Missouri
144	MP-116	24 to 31 ft.	Nebraska
139	MP-112	20 to 22 ft.	Illinois
310	MP-116	20 to 60 ft.	Tennessee
384	MP-115	15 to 60 ft.	Missouri
440	MP-115	15 to 60 ft.	Illinois

CONMACO, INC.
PHONE DRexel 1-3930
804 KANSAS AVE., KANSAS CITY, KANSAS

H & SHEET STEEL PILING
1400 PCS. BP8, BP10, BP12—BP14—55' to 60'
3700 PCS. BETH. SP6A 50', 56', 48' & 40' & 35'
1900 PCS. MP112—12' 15' 20' 25' 31' 35' & 60'
2800 PCS. BETH.—AP3 10', 15', 20', 25', 30' & 60'
2500 PCS. BETH.—DP2—20', 25', 30', 35', 40' & 60'
1200 PCS. ZP38-ZP32—20', 32', 36', 40', 50', 60'
600 PCS. ZP22—20' 26', 31, 40', 45', 60'
500 PCS. 10' & 15' Corrugated Piling
PILING BOUGHT—SOLD—RENTED
STOCKS: N. Y.—BOSTON—BUFFALO
TORONTO—BALTIMORE—JACKSONVILLE
MIAMI—RICHMOND—NEW ORLEANS
DIESEL LOCOMOTIVES & CRANES
12—Gen. Elec. 100, 80, 70, 65, 45, 25, & 23 ton
25 Ton Industrial Loco Crane 60' Boom
3600' JOY ELEC AIR COMPRESSOR
600 HP-2300 V-WN 224C-Radial New 58
R. C. STANHOPE, INC.
60 E. 42nd St. N. Y. 17, N. Y.
Telephone MU 2-3075 or MU 9-1898

PIPE
Surplus New & Used
FOR SALE, WANTED OR RENT

Call: HYACINTH 7-4900
PIPE, VALVES & FITTINGS
PILING • CULVERTS
ASBESTOS-CEMENT PIPE • ALUMINUM PIPE
ALBERT PIPE SUPPLY CO., Inc.
103 VARICK AVE., BROOKLYN 37, N.Y.

PILING IN FLA. & LA.
1500 pcs. Belval III-A—14', 25', 28', 34', & 40'
1700 pcs. Larsen II—20', 25', 30' & 40'
900 pcs. AP-3, DP-2—15', 20', 25', 30', 50'
500 pcs. H—10"—42 lb. 12"—53 lb. 60'
400 pcs. 15'—11 lb. Light Weight
1200 pcs. MP-112—15' 28', 32', 40' & 60'
SEABOARD STEEL PILING—TEL. RI-7-0461
P. O. Box 5071 — Sarasota, Fla.

H & STEEL SHEET PILING
Immediate Shipment—All Sizes
Chicago—Buffalo—Memphis—Cincinnati
WHISLER STEEL PILING CO.
1908 Railway Exchange Bldg., St. Louis 1, Mo.
CHestnut 1-4474

ASSOCIATED PIPE & FITTING CO., INC.
PILING PIPE SHELLS MANDREL FITTINGS
"H" BEARING PILE-POINTS AND SLEEVES
TIMBER SPLICERS AND SHOES
CULVERTS CIRCLE ARCH SECTIONAL
262 RUTHERFORD BLVD., CLIFTON, N.J. • PR 3-8400

STEEL-SHEET
PILING
All sections from our regular stocks
L. B. FOSTER CO.
Pittsburgh 30 · New York 7 · Chicago 4 · Houston 2
Los Angeles 5 · Atlanta 8 · Cleveland 35

STEEL SHEET PILING
LARSSEN and ROMBAS Sections
STOCKS AVAILABLE IN:
• Linden, New Jersey
• Ft. Lauderdale, Florida
• Houston, Texas
WESTERN SERVICES CORPORATION
601 E. Linden Ave., Linden, N. J.
MArket 4-4000 HUnter 6-4000
In Florida Call: Port Everglades Steel Co. Ft. Lauderdale—JA. 4-6545
In Houston Call: G. Oliver—CA. 4-7234

STEEL PIPE
NEW — STRUCTURAL — RECONDITIONED
VALVES & ALL TYPE FITTINGS
COMPLETE FABRICATION FACILITIES
GREENPOINT PIPE SUPPLY CORP.
341 Stagg Street, Brooklyn 6, N. Y. EV. 6-7200

PROFESSIONAL SERVICES

Cards arranged by areas, states, cities, names

Additional cards on following pages

NEW ENGLAND

Goodkind & O'Dea

Consulting Engineers

Design and Supervision
Foundations, Structures, Highways
1214 Dixwell Ave. Hamden, Conn.
610 Bloomfield Ave, Bloomfield, N. J.
325 Spring Street, New York, N. Y.
108 W. Lake Street, Chicago 1, Ill.

John J. Mozzochi and Associates

Civil Engineers

Highways - Airports - Developments
Survey - Design - Inspection

217 Hebron Avenue 200 Dyer Street
Glastonbury, Conn. Providence, R. I.

Fay, Spofford & Thorndike, Inc.

Engineers

Industrial Plants Incinerators
Water Supply, Sewerage, Drainage
Bridges Express Highways
Port and Terminal Work Airports

Designs Investigations
Supervision of Construction

Boston 8, Massachusetts

Jackson & Moreland, Inc.
Jackson & Moreland Int'l., Inc.

Engineers and Consultants

Electrical—Mechanical—Structural

Design and Supervision of Construction
-:- for -:-
Utility, Industrial and Atomic Projects

Surveys—Appraisals—Reports

Technical Publications

Boston Washington New York

Chas. T. Main, Inc.

Engineers

Design and Supervision of Construction for Industrial Plants—Electrical, Steam and Hydraulic Engineering—Investigations, Reports, and Appraisals.
Boston, Mass. Charlotte, N. C.

Metcalf & Eddy

Engineers

Soils, Foundations, Waterworks, Sewage Works, Drainage, Irrigation, Flood Control, Refuse, Industrial Wastes, Airports, Highways, Military Projects, Industrial and Commercial Facilities.
Statler Building, Boston 16, Massachusetts

Moore Survey & Mapping Corp.

Engineers-Photogrammetrists-Surveyors

Geodetic Control—Construction Layout
Aerial Topographic Surveys—Tax Maps
Hydrographic Surveys—Photogrammetry
29 Grafton Circle—Shrewsbury, Mass.

MIDDLE ATLANTIC

Airways Engineering Corp.

Airports, highways, dams, fuel storage, pipe lines, aerial topographic mapping.
1212-18th St., N.W.,
Washington 6, D. C.
Phone: REpublic 7-8131

Ewin Engineering Corporation

Designers of Port Facilities, Foundations, Industrial Plants, Bridges, Highways, Sewage Disposal and Urban Renewal.

5104 MacArthur Blvd. N.W.
Washington, D. C.

DuPont Plaza Center, Miami 32, Fla.
150 Savannah St. Mobile, Ala.

Whitman, Requardt & Associates

Engineers—Consultants

Civil—Sanitary—Structural
Mechanical—Electrical
Reports Plans, Supervision, Appraisals
1304 St. Paul St., Baltimore 2, Md.

Baker-Wibberley & Associates, Inc.

Consulting Engineers

Civil, Sanitary, Structural,
Foundations, Soils
49 N. Jonathan St., Hagerstown, Md.
Baltimore, Md. Waynesboro, Pa.

Louis Berger & Associates

Consulting Engineers
Studies—Design—Supervision
Highways—Structures—Airfields
177 Oakwood Avenue Orange, N. J.
2nd & Locust Streets Harrisburg, Pa.
200 S. Main St Salt Lake City, Utah
8 rue de Neuchatel Geneva, Switzerland
46 Baselerstrasse, Frankfurt, Germany

Joseph S. Ward and Associates

Consulting Soil and Foundation Engineers

Site Investigation, Boring Supervision, Laboratory Soil Testing, Foundation and Pavement Analysis and Design, Construction Supervision, Engineering Reports and Consultation
91 Roseland Avenue Caldwell, N. J.
Jefferson Building Phila., Penna

Victor J. Le Pinto Associates

Consulting Engineers

SOILS - FOUNDATIONS - HIGHWAYS
Investigation - Design - Supervision
Sub Surface Exploration
Laboratory and Field Tests
Land Development Engineering
58 Branchport Ave., Long Branch, N. J.

Albert C. Jones Associates

Consulting Engineers

Private and Municipal Engineering
Sewerage-Sewage Treatment
Water Supply and Distribution
Investigations and Appraisals
Photogrammetric Engineering
Aerial Maps
222 High St. Mount Holly, New Jersey

Edwards and Kelcey

Engineers and Consultants

Traffic Transportation Parking
Expressways Airports Public Works
Surveys - Reports - Design - Supervision
3 William Street, Newark 2, New Jersey
Boston Salt Lake City New York
Providence Minneapolis

Porter & O'Brien

O. J. PORTER & COMPANY

CONSULTING ENGINEERS

Airports — Highways — Expressways — Buildings — Bridges — Dams — Harbors — Foundations — Stabilization — Pavements
Reports, Designs & Supervision

415 Frelinghuysen Ave., Newark 5, N.J.
4201 Sunset Blvd. Los Angeles 29, Cal.
1421-47th Avenue Sacramento 22, Cal.

Boswell Engineering Co.

Consulting Engineers

Highways, Bridges, Airports, Municipal

Ridgefield Park, N. J.
West Nyack, New York
Salt Lake City, Utah
Anchorage, Alaska

M. C. Tomasetti

Consulting Engineers—Surveyors

Designs, Construction Supervision
Highways—Airfields—Structures
Soils—Foundations—Pavements—Drainage
Materials Investigations
Site Designs, Subdivisions, Surveys
Greenwich, Conn., New Rochelle, N. Y.

B. K. Hough

Consulting Engineer

Soils & Foundation Engineering

Site investigations, soil testing, design analysis for earthworks, foundations and pavements, field inspection, engineering reports, consultation.
121 E. Seneca St. Ithaca, New York

Clinton Bogert Engineers

Consultants

Clinton L. Bogert Ivan L. Bogert
Donald M. Ditmars Robert A. Lincoln
Charles A. Manganaro William Martin
Water & Sewage Works Incinerators
Drainage Flood Control
Highways and Bridges Airfields
145 E. 32nd St., New York 16, N. Y.

Ammann & Whitney

Consulting Engineers

Design and Supervision of Construction of Bridges, Highways, Expressway, Buildings, Special Structures, Airports and Airport Facilities

111 Eighth Avenue, New York 11, N.Y.

Milwaukee - Washington - Philadelphia
Paris - Athens - Tehran

Blauvelt Engineering Co.

CONSULTING ENGINEERS

Highways,

Bridges,

Reports

New York, N. Y. Philadelphia, Pa.
Woodbury, N. J. Crystal Lake, Ill.

Bowe, Albertson & Associates

Engineers

Water and Sewage Works—Industrial Wastes — Refuse Disposal — Valuations —Laboratory Service

75 West St. 1000 Farmington Ave.
New York 6, N.Y. W. Hartford 7, Conn.

Brown Engineers
Brown Engineers International

Architects—Engineers—Planners

Airports, Bridges, City Planning, Commercial Buildings, Dams, Highways, Housing, Hydraulics, Hydroelectric Power, Industrial Plants, Ports, Railroads, Sewerage, Transportation Studies, Urban Renewal, Water Supply.

Studies—Design—Management
Supervision of Construction

Coliseum Tower
10 Columbus Circle
New York 19, N. Y.

Buck, Seifert and Jost

Consulting Engineers

Water Supply — Sewerage — Hydraulic Developments—Reports and Valuations, Chemical and Biological Laboratories.
New York City, 112 E. 19th St.

Ebasco Services Incorporated

ENGINEERS
CONSTRUCTORS
MANAGEMENT CONSULTANTS
Design and Construction
Financial and Operating Consultation
Investigations and Reports
Consulting Engineering
Appraisals
Two Rector Street, New York 6, N. Y.
140 S. Clark Street, Chicago 3, Ill.
1410 Commerce Bldg., Dallas 1, Texas
611 Equitable Bldg., Portland 4, Ore.
120 Montgomery Street,
San Francisco 4, Cal.
1625 Eye Street, N.W. Wash. 6, D. C.

Gibbs & Hill, Inc.

Consulting Engineers
Water, Sewage & Industrial Waste Treatment Works — Roads, Bridges & Railroads—Conventional & Nuclear Power Generation — Electric Transmission & Distribution Systems—Industrial & Communication Facilities.
PENN STATION NEW YORK 1, N.Y.

Hardesty & Hanover

Consulting Engineers

Bridges
Fixed and Movable
Highways
Expressways, Thruways
Special Structures
Design, Supervision,
Inspection, Valuation

101 Park Avenue New York 17

Frederic R. Harris, Inc.

Consulting Engineers

New York, N. Y.

Norwalk, Conn. New Orleans, La.
Toronto, Canada The Hague, Holland

Hazen and Sawyer

Engineers

Richard Hazen Alfred W. Sawyer
H. E. Hudson, Jr.
Water and Sewage Works
Industrial Waste Disposal
Drainage and Flood Control
360 Lexington Ave., New York 17, N.Y.

Howard, Needles, Tammen & Bergendoff

Consulting Engineers
Bridges • Structures • Foundations
Admin. Ser. • Traffic & Parking •
Express Highways • Airports
Kansas City - Cleveland - New York

King & Gavaris

CONSULTING ENGINEERS

Associates:
W. Mack Angas
David Carsen
Dr. G. P. Tschebotarioff
Sidney Zecher

Bridges, Highways, Tunnels
Waterfront Structures, Reports
Investigations, Foundations
Design & Supervision of Construction
41 E. 42nd St., New York 17, N. Y.

Litchfield Whiting Bowne & Assoc.

Engineers—Architects

Sewage, Water, Bridges, Airports, Flood Control, Electrification, Hospitals, Schools, City Planning, Abbatoirs, Highways, Air Conditioning, Industrial Buildings, Military.
8 West 40th St., N. Y. 18, N. Y.
Rome Tehran Bangkok

Modern Engineering Corporation

Design—Consulting

62 William Street, New York, N. Y.

Moran, Proctor Mueser & Rutledge

Consulting Engineers

Foundations for Buildings, Bridges and Dams; Tunnels, Bulkheads, Marine Structures; Soil Studies and Tests; Reports, design and supervision.

415 Madison Ave., New York 17, N.Y.
Eldorado 5-4800

Parsons, Brinckerhoff, Quade & Douglas

ENGINEERS

Bridges, Highways, Tunnels, Airports, Subways, Harbor Works, Dams, Canals, Traffic Parking and Transportation Reports, Power, Industrial Buildings, Housing, Sewerage and Water Supply.

165 Broadway New York 6, N. Y.

Malcolm Pirnie Engineers

Malcolm Pirnie Carl A. Arenander
Ernest W. Whitlock Malcolm Pirnie, Jr.
Robert D. Mitchell Alfred C. Leonard

MUNICIPAL AND INDUSTRIAL
Water Supply—Water Treatment
Sewerage and Waste Treatment
Drainage—Rates—Refuse Disposal

25 West 43rd St., New York 36, N. Y.
2910 Grand Central Ave.,Tampa 9, Fla.

PROFESSIONAL SERVICES

Cards arranged by areas, states, cities, names — **Additional cards on preceding and following pages**

E. Lionel Pavlo

Consulting Engineer

Design, Supervision, Reports
Bridges, Highways, Expressways
Marine Structures, Public Works
Industrial Construction, Airports

642 Fifth Ave. New York 19, N. Y.

The Pitometer Associates

Engineers

Water Waste Surveys
Trunk Main Surveys
Water Distribution Studies
Water Measurements & Special
Hydraulic Investigations
New York, 50 Church St.

Alexander Potter Associates

Consulting Engineers

Water Works, Sewerage, Industrial Waste, Hydraulic Works, Reports, Designs, Appraisals.

50 Church St., New York, N. Y.

Praeger-Kavanagh

Engineers

126 East 38th St., New York 16, N. Y.

Seelye Stevenson Value & Knecht

Consulting Engineers

Richard E. Dougherty, Consultant

Airports, Highways, Bridges, Dams, Water Supply, Sanitation, Railroads, Piers, Industrial Plants, Reinforced Concrete, Steel, Industrial Waste Disposal, Foundations, Soil Studies, Real Estate Development.
Civil — Mechanical — Electrical

101 Park Avenue New York 17, N. Y.

Severud-Elstad-Krueger-Associates

Consulting Engineers

Structural Design - Supervision
Reports - Buildings - Airports
Special Structures

415 Lexington Ave., New York 17, N.Y.

Singstad & Baillie

Consulting Engineers

Ole Singstad — David G. Baillie, Jr.
Tunnels, Subways, Highways
Foundations, Parking Garages

24 State St. New York 4, N. Y.

Frederick Snare Corporation

Engineers—Contractors

Harbor Works, Bridges, Power Plants, Dams, Docks and Terminals.

Difficult and Unusual Foundations A Specialty

233 Broadway, New York City 7

Havana, Cuba — Lima, Peru
Bogota, Columbia, Caracas, Venezuela

Steinman, Boynton, Gronquist & London

Consulting Engineers

HIGHWAYS - BRIDGES
STRUCTURES

117 Liberty St., New York 6, N. Y.

Tippetts-Abbett-McCarthy-Stratton

Engineers and Architects

Ports, Harbors, Flood Control, Power Dams, Bridges, Tunnels, Highways, Railroads, Subways, Airports, Traffic, Foundations Water Supply, Sewerage, Reports, Design, Supervision, Consultation.

375 Park Avenue, New York 22, N. Y.

Arnold H. Vollmer Associates

Consulting Engineers

Highways, Parks, Bridges, Municipal Improvements, Public Works, Reports, Surveys, Contract Plans.
25 W. 45th Street, New York 36, N. Y.
Telephone: Circle 7-6250

Lawrence S. Waterbury

Consulting Engineer

Bowling Green 9-9298
26 Broadway, New York 4

Keis & Holroyd

Consulting Engineers

Formerly Solomon & Keis
Since 1906
Water Supply, Sewage Disposal, Garbage & Refuse Incineration, Industrial buildings.
Troy, N. Y.

Capitol Engineering Corporation

Consulting Civil Engineers

Dillsburg, Pennsylvania, U.S.A.

Gannett Fleming Corddry & Carpenter, Inc.

ENGINEERS

Dams, Water Works, Sewage, Industrial Wastes & Garbage Disposal, Highways, Bridges & Airports
Traffic & Parking — Appraisals, Investigation & Reports.

Harrisburg, Penna.

Branch Offices
Pittsburgh, Pa. — Philadelphia, Pa.
Daytona Beach, Fla.

Grof & Myers

Consulting Engineers

Highways — Bridges — Airports
Surveys — Reports — Plans
Construction Supervision

1824 North 4th St. Harrisburg, Pa.

Modjeski and Masters

Consulting Engineers

Bridges and other Structures
Foundations
Highways and Expressways

900 North Sixth St. Harrisburgh, Pa.
Philadelphia - Miami - New Orleans

Albright & Friel Inc.

Consulting Engineers

Water, Sewage, Industrial Wastes and Incineration Problems, City Planning, Highways, Bridges and Airports, Dams, Flood Control, Industrial Buildings, Investigations, Reports, Appraisals and Rates

3 Penn Center Plaza Phila. 2, Pa.

Fridy, Gauker, Truscott & Fridy, Inc.

Architects & Engineers

Water, Sewer, Waste Disposal, Roads, Airports, Power & Lighting, Petroleum Facilities, Hospitals, Schools, Public & Industrial Buildings, Reports, Plans, Supervision, Appraisals.

1321 Arch St. Philadelphia 7, Pa.

Harris-Dechant Associates

Consulting Engineers

Water Supply, Dams, Stream Improvement, Flood Control, Port & Harbor Development; Sanitary & Industrial Wastes; Hydro & Steam Power; Highway Engineering & Design.
Surveys—Reports—Economics

123 S. Broad St., Philadelphia 9, Pa.

Yule, Sticklen, Jordan & McNee

ENGINEERS

Bridges, Highways, Airports
Design, Investigations, Reports
Supervision of Construction
Civil, Structural Mechanical & Electrical

Cedar Cliff Drive
Camp Hill, Pa.

1225 Vine Street
Philadelphia 7, Pa.

5564 North High Street
Columbus, Ohio

Justin & Courtney

Consulting Engineers

Joel B. Justin - Neville C. Courtney
Dams and Power Problems, Hydroelectric, River Basin Development, Water Supply, Foundations.

121 South Broad Street
Philadelphia 7, Pa.

Morris Knowles Inc.

Engineers

Water Supply and Purification Sewerage and Sewage Disposal, Valuations, Laboratory, City Planning.

Pittsburgh, Pa.

Pennsylvania Drilling Company

Subsurface Explorations, Grouting, Industrial Water Supply, Mineral Prospecting.
Large Diameter Drilled Shafts, Reports

1205 Chartiers Ave. Pittsburgh 20, Pa.

Swindell-Dressler Corp.

CONSULTING ENGINEERS

Industrial Plants — Waterworks — Sewer Systems — Highways — Dams — Bridges — Surveys — Reports — Design and Construction Supervision

Box 1888 • Pittsburgh 30, Pa.

Michael Baker, Jr., Inc.

Consulting Engineers, Planners & Surveyors; Airport, Highway & Bridge Design; Water & Sewerage; Municipal Engineering; Photo Mapping; City Planning urban Ren. & Redev. Surveys; Soils Lab. Home Office—Rochester, Pa. Br. Off. Jackson, Miss. Charleston, W. Va., Harrisburg, Pa.

Sprague & Henwood, Inc.

Drilling Services

Foundation Investigations, Soil Testing & Test Borings, Grout Hole Drilling & Pressure Grouting, Diamond Core Drilling

Main Office
221 W Olive Street, Scranton, Pa.

Branches:
1009 Western Savings Fund Bldg., Philadelphia, Pa.
11 W. 42nd St., New York, New York
300 Mt. Lebanon Blvd., Suite 100 Pittsburgh 34, Pa.
Box 1446—Grand Junction, Colorado
Nashville, Tennessee
Tucson, Arizona
Buchans, Newfoundland

Frank D. McEnteer's Associates, Inc.

Consulting Engineers

Bridges, Highways, Industrial Plants
Design, Investigations, Surveys

Terminal Building, Clarksburg, W. Va.

SOUTH

Harry Hendon & Associates, Inc.

Engineers

Civil Engineers—Public Utilities
Investigation—Designs
Supervision of Construction

P. O. Box 740A 925 Sligh Blvd.
Birmingham 13, Ala. Orlando, Florida

Palmer and Baker Engineers, Inc.

Consulting Engineers - Architects

Surveys-Reports-Design-Supervision Consultation

Transportation and Traffic Problems
Tunnels-Bridges-Highways-Airports
Industrial Buildings
Waterfront and Harbor Structures
Graving and Floating Dry Docks
Complete Soils, Materials and Chemical Laboratories

Mobile, Ala New Orleans, La.
Washington, D. C.

Rader and Associates

Engineers - Architects

Sewage Disposal, Water Works, Ports, Airports, Bridges, Highways, Office and Commercial Buildings, Industrial Plants. Reports, Investigations, Consultations, Aerial Photography, Photogrammetry.

First Natl. Bank Bldg., Miami 32, Fla.

J. Stephen Watkins

Consulting Engineers

Highways—Bridges—Sewerage
Water Supply—Industrial Plants

446 E. High St., Lexington, Kentucky
2617 Dixie Highway, Louisville, Ky.
107 Hale St., Charleston, W. Va.

Standard Drilling Company

Drilling Services

Foundation Investigations, Soil Testing & Test Borings, Grout Hole Drilling, and Pressure Grouting, Diamond Core Drilling.

P.O. Box 174. Somerset, Kentucky.

Eustis Engineering Company

FOUNDATION AND SOIL
MECHANICS INVESTIGATIONS

Soil Borings — *Laboratory Test*
Foundation Analyses — *Reports*

3635 Airline Highway
Metairie, Louisiana

Schmidt Engineering Co. Inc.

Consulting Engineers

Investigations, Reports, Designs, Heavy Construction — Dams — Hydroelectric Projects—Foundation Explorations and Treatment—Water and Sewerage Works
Emerson Building Chattanooga, Tenn.
Greater Tenn. Bldg. Knoxville, Tenn.

ETCO Engineers and Associates

Foundation Consultants

Test Borings — Laboratory Tests
Recommendations, Design and Supervision

2116 Canada Dry St., Houston 23, Tex.
727 Main St. Baton Rouge, La.
427 Carondelet St., New Orleans 12, La.

Mott Core Drilling Co.

Contractors—Manufacturers

Core Borings for Buildings, Bridges, Foundation Soil Tests, Highways, Pressure Grouting, Dams, Mine Shafts
Mineral Prospecting

Mott Bldg. 830 Eighth Ave.
Huntington, 17, W. Va.

MIDDLE WEST

Alvord, Burdick & Howson

CONSULTING ENGINEERS

Water Works	Sewerage
Water Purification	Sewage Treatment
Floor Relief	Power Generation
Drainage	Appraisals

20 North Wacker Drive, Chicago

Consoer, Townsend & Associates

Consulting Engineers

Sewage treatment, sewers, storm drainage, flood control—Water supply and treatment—Highway and bridges—Airports—Urban renewal—Electric and gas transmission lines—Rate studies, surveys and valuations—Industrial and institutional buildings.

360 East Grand Ave. Chicago 11, Ill.

THIS SECTION
is available to consulting engineers to contact prospective clients every week or every other week.

PROFESSIONAL SERVICES

Cards arranged by areas, states, cities, names

Additional cards on preceding and following pages

Dames & Moore

Consultants in
Applied Earth Sciences
Soil Mechanics Engineering Geology
Geophysics
Atlanta, Chicago, Honolulu, Houston, Los Angeles, New York, Portland, Salt Lake City, San Francisco, Seattle.

De Leuw, Cather & Company

CONSULTING ENGINEERS

Public Transit — Subways
Traffic & Parking — Railroad Facilities
Expressways — Industrial Plants
Grade Separations — Municipal Works
Urban Renewal — Port Development

150 North Wacker Drive, Chicago 6
San Francisco New York Boston

Erik Floor & Associates, Inc.

Consulting and Design Engineers
Hydroelectric Projects — Dams — Flood Control—Hydraulic Structures—Irrigation — Transmission Lines — Investigations—Reports—Designs
139 N. Clark St. Chicago 2, Ill.

Greeley and Hansen

Engineers
Water Supply, Water Purification
Sewerage, Sewage Treatment
Flood Control, Drainage, Refuse Disposal
14 E. Jackson Boulevard
Chicago 4, Illinois

Harza Engineering Co.

Consulting Engineers

Hydroelectric Plants & Dams
Transmission Lines
Flood Control, Irrigation
River Basin Development

400 West Madison Street Chicago 6

Hazelet & Erdal

CONSULTING ENGINEERS
Fixed & Movable Bridges, Expressways, Industrial Plants, Airports, Dams.
Monadnock Block, Chicago 4, Ill.
Dixie Terminal Bldg., Cincinnati 2, O.
Commerce Bldg., Louisville 2, Ky.
Oding Bldg., Lansing 33, Mich.

Pioneer Service & Engineering Co.

Consulting and Design Engineers
Operations—Purchasing
Construction Management
Public Utilities—Industrials
231 So. La Salle St. Chicago 4

Sargent & Lundy

ENGINEERS
Consultants to the Power Industry
Studies • Design • Supervision
140 South Dearborn Street,
Chicago 3, Ill.

Suhr, Peterson, Peterson & Suhr

Consulting Engineers
REPORTS—PLANS—SUPERVISION
Sewerage, Water Supply, Flood Control & Drainage, Airports, Roads, Surveys
Fixed & Movable Bridges
120 N. Wells St., Chicago 6, Ill.
P. O. Box 1858, Anchorage, Alaska

Chas. W. Cole & Son

Engineers and Architects
3600 E. Jefferson Blvd.
South Bend, Indiana
2112 W. Jefferson St.
Joliet, Illinois

The Hinchman Corporation

Consulting Engineers
"WORLD-WIDE ACTIVITIES"
Survey • Design • Supervision
Specializing In
Corrosion Control•F.C.C. Certification Tests
Electromagnetic Interference Studies
Francis Palms Bldg., Detroit, Michigan

The H. C. Nutting Company

Testing Engineers—Inspection Service
Foundation Investigation—Test Borings
Soil Mechanics—Sewage Flows
Construction Control—Concrete
Water Waste Survey
4120 Airport Road Cincinnati 26, O.

The Austin Company

Design and Construction
Manufacturing and Process Plants
Newspaper and Broadcasting Bldgs.
Power Plants—Industrial
Industrial Office Buildings and Laboratories
Merchandising Bldgs. & Facilities
Plant Location Surveys

New York CLEVELAND Houston
Chicago Montreal Los Angeles
Detroit Seattle

Havens and Emerson

A. A. Burger, H. H. Moseley, J. W. Avery, F. S. Palocsay, E. S. Ordway, A. M. Mock, G. H. Applanalp, S. H. Sutton
Frank C. Tolles, Consultant
Water, Sewerage, Garbage, Industrial Wastes, Valuation—Laboratories
Leader Bldg. Woolworth Bldg.
Cleveland 14 New York 7

The Osborn Engineering Co.

DESIGNING-CONSULTING

Industrial Plants — Office Buildings
Stadiums Grand Stands Field Houses
Bridges Garages Laboratories

7016 Euclid Ave. Cleveland 3, Ohio

Rackoff Associates

Engineers
Highways, Expressways, Bridges, Sewerage and Water Systems, Fiscal and Master Planning, Investigations, Urban Renewal, Supervision
1033 W. Third Ave., Columbus, Ohio

Hudson Worthington Associates Limited

Civil Structural Municipal
Industrial, Commercial, Structures, Highway, Bridge, Sewage, Industrial waste. Analysis, Research, Estimates, Reports.
214 N. Main St., Hudson, Ohio
OL 3-6787

Slocum & Roberts

Construction Consultants
Heavy Construction Project Investigations, Planning, Estimating & Bidding, Plant Layout & Management
504 E. Pine St. 11820 Edgewater Drive
Alhambra, Calif. Lakewood 7, Ohio

Jones, Henry & Williams

Consulting Sanitary Engineers
Water works Sewerage & Treatment
Waste Disposal
2000 W. Central Ave., Toledo 6, Ohio

Toledo Testing Laboratory

Engineers—Chemists

Concrete—Soils—Asphalt
Inspection — Research
Tests — Development
Foundation Investigation
Borings—Diamond Drilling
Load Tests
Soils Mechanics Laboratory
1810 North 12th St. Toledo 2, Ohio

When you need a SPECIALIST in a hurry . . .

Engineering News-Record's Professional Service Section offers the quickest, most direct method of contacting consultants who may be available NOW.

WEST OF MISSISSIPPI

Heron Engineering Co.

Consulting Engineers
For all types of Aerial Tramways, Cableways, and Suspended Structures
2000 South Acoma St.
Denver 23, Colorado

Stanley Engineering Company

Consulting Engineers
Hershey Building 208 S. LaSalle St.
Muscatine, Ia. Chicago 4, Ill.

Black & Veatch

Consulting Engineers
Water - Electricity - Sewage - Gas - Industry - Reports, Design, Supervision of Construction, Investigations, Valuation and Rates.
1500 Meadow Lake Parkway
Kansas City 14, Missouri

Burns & McDonnell

Engineers—Architects—Consultants
4600 E. 63rd St. Trafficway
Kansas City 41, Missouri

Russel and Axon

Consulting Engineers
Civil — Sanitary — Structural
Industrial — Electrical
Rate Investigations
408 Olive St. St. Louis 2, Mo.
Municipal Airport, Daytona Beach, Fla.

Sverdrup & Parcel Associates, Inc.

Engineers—Architects
Bridges, Structures and Reports, Industrial and Power Plant Engineering
915 Olive St., St. Louis, 1, Mo.
417 Montgomery St., San Francisco Calif.

Benham Engineering Company

Established in 1909
Design and Consulting Engineers
215 N E 23rd Street
Oklahoma City 5, Oklahoma

Spencer J. Buchanan and Associates, Inc.

Consulting Engineers
Soil Mechanics and Foundation Engineering. Civil Engineering Services Reports, Design and Field Supervision.
310 Varisco Building, Bryan, Texas
TAylor 2-3767

Soil Mechanics Incorporated

Foundation Exploration and Testing Services
Site Investigations, Soil Borings, Field and Lab Testing, Load Tests, Reports
310 Varisco Building, Bryan, Texas
TAylor 2-3767

Lockwood, Andrews & Newnam

Consulting Engineers
Navigation Facilities — Public Works
Airports — Earthworks — Roads,
Structural, Mechanical — Electrical
Reports — Design — Supervision
Surveys — Valuations
Corpus Christi—Houston—Victoria, Texas.

FAR WEST

International Engineering Company, Inc.

ENGINEERS
Investigation - Reports - Design
Procurement - Field Engineering
Domestic and Foreign
74 New Montgomery St.
San Francisco 5, California

Nevada Testing Laboratories, Ltd.

Engineering—Civil—Soils & Foundation Consultants—Field Testing—Soil Borings — Rock Drilling — Materials Field Control—Load Tests—Laboratory Testing—Soils—Concrete—Asphalt
300 W. Boston Ave. Las Vegas, Nev.

INSPECTION & TEST

Johnson Soils Engineering Laboratory

Foundation Design - Highway & Airport Pavements - Construction Control - Load Tests Shear & Consolidation Tests - MOBILE LABORATORIES
193 West Shore Ave., Bogata, N. J.
Bogata-Hubbard 7-4408

Pittsburgh Testing Laboratory

A national service-with complete laboratory and inspection facilities.
Laboratories in principal cities.
Main Office: 1330 Locust St.,
Pittsburgh, Pa.

AERIAL SURVEYS

Aerial Map Service Co.

Topographic, Planimetric, Photo Maps for Highways, Mining, Resources, Construction. City Maps, Tax Maps, Photo Geology, Tellurometer Radio Distance Measurements, Triangulation, Electronic Computation.
1016 Madison Ave., Pittsburgh 12, Pa.

American Air Surveys, Inc.

AERIAL TOPOGRAPHIC MAPS & AERIAL PHOTOS FOR
• Highways • Airports • Power & Pipe Lines • Railroads • Mining • All types construction • Stockpile Inventories
907 Penn Ave. Pittsburgh 22, Pa.
Branches-Manhasset, N.Y.-Atlanta, Ga.

ESTIMATING

Estimators Ltd., Inc.

ACCURATE — CONFIDENTIAL
Professional Construction Estimators
Any Project — Anywhere
Main Office:
347 E. Market St., Long Beach 5, Calif
Phones GArfield 3-0084 NEvada 6-5033
or Cable ESTIMINC

GEOLOGISTS

Geologic Associates

ENGINEERING GEOLOGISTS
Studies and Reports
Foundation Investigations
Specialized Drilling and Sampling
Brentwood, Tennessee
Phone (Nashville) VErnon 2-1748

GEOPHYSICISTS

Alpine Geophysical Associates, Inc.

Geophysicists-Engineers-Oceanographers
Land and Marine Foundation Surveys
Highways-Bridges-Tunnels-Buildings
Consultants-Earthquake-Oceanographic
10 Oak Street 2418 Tangley
Norwood, New Jersey Houston, Texas

THE CONSULTING ENGINEER

By reason of special training, wide experience and tested ability, coupled with professional integrity, the consulting engineer brings to his client detached engineering and economic advice that rises above local limitations and encompasses the availability of all modern developments in the fields where he practices as an expert.

ADVERTISERS IN THIS ISSUE

American Cyanamid Company..... 34
Armco Drainage & Metal Products, Inc..... 26

Bethlehem Steel Co.....43-50; 74

Caterpillar Tractor Co., Engine Div..... 7
Chicago Pneumatic Tool Company..... 68
James B. Clow & Sons, Inc..... 53
The Colorado Fuel & Iron Corp., Wickwire Spencer Steel Div.....30-31
Concrete Reinforcing Steel Institute..... 57

Detroit Diesel Engine Div., General Motors Corp.....76-77
Douglas Fir Plywood Association..... 4-5
Richard Dudgeon Inc..... 65
E. I. du Pont de Nemours & Co., Inc., Explosives Dept. 25

Economy Forms Corp..... 66
Euclid Div., General Motors Corp.....54-55

Fairbanks, Morse & Company..... 40
The Flintkote Company..... 28
Foundation Wellpoint Corporation..... 57

Gardner-Denver Company..... 8-9
The Goodyear Tire & Rubber Co., Truck Tires Dept..... 1
Griffin Wellpoint Corp..... 14

Irving Subway Grating Co., Inc.....58-59

Jenkins Bros. 12
Joy Manufacturing Company..... 29

Keuffel & Esser Co..... 73

Lead Industries Assn..... 67
Leschen Wire Rope Div., H. K. Porter Co., Inc. 60
Liberty Mutual Insurance Company..... 16

Macomber, Inc. 23
The Master Builders Company.....3rd Cov.
Mayo Tunnel & Mine Equipment..... 65
McGraw-Hill Book Co., Inc..... 91
W. R. Meadows, Inc..... 71
Miller Electric Mfg. Co., Inc..... 63
Moretrench Corporation 69

National Clay Pipe Manufacturers, Inc..... 10
Northwest Engineering Co..... 3

The Owen Bucket Co..... 72
Oxford University Press..... 41

Pennsylvania Pneumatic Concrete & Refractories, Inc..... 63
Pittsburgh-Des Moines Steel Company.2nd Cov.
Posey Iron Works, Inc..... 65

Research Publishing Co..... 69
The Robinson Clay Products Co..... 39
Rodgers Hydraulic, Inc..... 41

Standard Dry Wall Products, Inc..... 42
Superior Concrete Accessories, Inc..... 70
Symons Clamp & Mfg. Co..... 2

Templeton, Kenly & Co..... 66
The Travelers Insurance Co..... 78

Union Wire Rope Corp., Armco Steel Corp.36-37
U. S. Steel Corp.....11; 56

Wheeling Corrugating Co.....64-65
Wild Heerbrugg Instruments, Inc..... 6
Worthington Corp.....4th Cov.

Professional Services 88-90

CLASSIFIED ADVERTISING
F. J. Eberle, Business Mgr.

Employment Opportunities 85, 86
Notices
Proposals 82-84
Equipment
(Used or Surplus)
(For Rent, Sales Wanted).....86-87
Advertisers' Index 84

ENGINEERING NEWS-RECORD

330 West 42 St., New York 36—LOngacre 4-3000

ABP Member ABC

Number of copies of this issue printed 87,567

D. S. ROBERTSON, Advertising Sales Manager
HUGH J. CARLSON, Business Manager
LANG CARPENTIER, Production Manager
JACK NEVINS, Assistant Production Manager

ADVERTISING REPRESENTATIVES

Atlanta, 9—1375 Peachtree St., N.E.,
Robert H. Powell, Jr.

Boston, 16—McGraw-Hill Bldg., Copley Square
C. D. Neulen

Chicago 11—645 North Michigan Ave.
L. H. Hunt, W. G. Payne, Earl S. Moore, Jr.

Cleveland, 13—1164 Illuminating Bldg., 55 Public Square
H. A. Bergstrom, F. P. DiToro

Dallas, 1—Vaughn Bldg., 1712 Commerce St.,
John Grant

Denver, 2—Tower Building, 1700 Broadway
J. W. Patten

Detroit, 26—856 Penobscot Bldg.
R. I. Mace

Houston, 25—Prudential Bldg., Holcombe Blvd.—Joseph C. Page

Los Angeles, 17—1125 W. Sixth St.,
Knox Bourne, S. S. Tiebout

New York, 36—500 5th Ave.
C. D. Neulen, H. T. Olsen
Robert L. Barker

Philadelphia, 3—Six Penn Center Plaza
D. G. Jensen
Patrick Keleher

Pittsburgh, 22—4 Gateway Center
Malcolm Russell

Portland 4, Oregon—Room 445, Pacific Bldg.
Scott Hubbard

St. Louis, 8—Continental Bldg., 3615 Olive St.
E. B. Mingle, Jr.

San Francisco 11—255 California St.
John J. Hernan

OTHER SALES OFFICES:

United Kingdom, Edwin E. Murphy, 34 Dover Street, London W.1—Germany, Austria, Stan Kimes, 85 Westendstrasse, Frankfort/Main, Germany—Switzerland, Italy, France and Belgium, Michael R. Zeynel, 2 Place du Port Geneva, Switzerland

JUST PUBLISHED

HANDBOOK OF FLUID DYNAMICS

Prepared by a Staff of Specialists

VICTOR L. STREETER, Editor-in-Chief
Professor of Hydraulics
University of Minnesota

Expert guidance on fundamental principles and practical applications of fluid dynamics is placed at your command in this master Handbook. Its 27 comprehensive sections—prepared by 32 leading authorities—supply time-saving mathematical tools, advanced theory, analytical methods, and useful facts and data for handling today's fluid-flow problems. From properties of fluids and equations of fluid flow . . . through one-dimensional and two-phase flow . . . to sedimentation, turbo-machinery, and hydrostatic lubrication—a full range of topics is expertly covered. Here is vital information in such key areas as: ideal-fluid flow—laminar flow—transport phenomena in multicomponent systems—compressible flow—and many others. Included also in this authoritative reference is practical material on conversion, transmission, and control of fluid power . . . lubrication mechanics . . . open-channel flow . . . dimensional analysis . . . fluid transients in engineering systems . . . and use of the digital computer for fluid-flow calculations. **1240 pp., 907 illus. and tables, $24.00**

ELECTRICAL ESTIMATING

Just Out—3rd Ed. Practical know-how for safer, more dependable bids. Covers training of estimators, use of estimating tools, preliminary estimates, preparation of final bid sheets, etc. **By R. Ashley,** *Elec. Const. & Mainten.* **3rd Ed. 435 pp., 222 illus., charts, and tables, $12.50**

DESIGN AND CONSTRUCTION OF PORTS AND MARINE STRUCTURES

Just Out. Treats design and building of harbor and off-shore structures. Ranges from survey of port growth . . . to pier and dock design. **By A. DeF. Quinn, Fred. Snare Corp. 529 pp., 307 illus., $16.00**

CONSTRUCTION ESTIMATES AND COSTS

Describes fully the estimator's job—how to accurately compute material, labor, equipment, and overhead costs, plus profit. Revised edition gives modern data on wages, materials, etc. **By H. E. Pulver, Consul. Engr. 3rd Ed. 640 pp., 126 illus., $12.00**

FREE EXAMINATION

McGraw-Hill Book Co., Inc., Dept. ENR-5-25
327 W. 41st St., N.Y.C. 36

Send me book(s) checked below for 10 days' examination on approval. In 10 days I will remit for book(s) I keep, plus few cents for delivery costs, and return unwanted book(s) postpaid. (We pay delivery costs if you remit with this coupon—same return privilege.)

☐ Streeter—**Hdbk. of Fluid Dynamics,** $24.00
☐ Ashley—**Electrical Estimating,** $12.50
☐ Quinn—**Des. & Const. of Ports & Marine Struc.,** $16.00
☐ Pulver—**Const. Est. & Costs,** $12.00

(PRINT)
Name .....
Address .....
City ..... Zone ..... State .....
Company .....
Position .....

For price and terms outside U.S. write McGraw-Hill Int'l. N. Y. C. ENR-5-25

More Help, Not Less

THE POWER TO TAX, said Chief Justice John Marshall 150 years ago, involves the power to destroy. It was a call to thoughtful, responsible action by taxing authorities, a call that should be heeded today by those proposing more taxes on U.S. companies operating abroad.

What Congress could destroy by thoughtless and unwise legislation is America's ability to compete successfully in international trade. And this definitely includes construction abroad.

The leading U. S. contracting and engineering firms who have been doing work overseas have banded together to present testimony to Congress opposing changes in the tax laws applicable to their operations. The story they can tell is reasonable and logical.

As matters now stand, profits made on work overseas can be left abroad and used as working capital to carry out other foreign work. Only when the profits are brought back to the U. S. are they subject to U. S. taxes. The proposal is to abolish this tax deferral practice, and to tax all profits as soon as they are made.

The firms working abroad can point out that they pay local taxes in the countries where they operate. To have full U. S. taxes imposed on top of these would be a definite handicap. It would be even more stringent than the practice now in effect with respect to profits brought back to the U. S., which are taxed only at the difference between the U. S. rate and the rate already paid abroad.

Justification for the use of a "foreign base" company —one of the practices most widely criticized—can also be made. The foreign base company, a subsidiary of the U.S. firm, is usually set up in a country that exempts or imposes very low taxes on income earned outside its borders. Profits made elsewhere, therefore, can be channeled to the foreign base company instead of being brought back to the U. S., where they would be taxed at rates up to 52%.

This is declared to be bad. But is it, when it permits the company to assemble large blocks of working capital that it can use in expanding its operations abroad in competition with firms from other countries?

This competition, which U. S. construction companies must meet abroad, is becoming fiercer every day. Firms from such countries as Great Britain, France, Italy and West Germany benefit not only from lower labor rates and taxes at home, but their work abroad is often subsidized by their governments. U. S. firms enjoy none of these advantages. It would be shortsighted indeed to penalize them further.

There is a final and clinching argument. Excessive taxes, if they did not destroy the companies concerned, could at least cause them to abandon their foreign operations. Then the large amounts of money held by the foreign base companies would no longer be available to carry out construction jobs in underdeveloped countries. The money could only be replaced by larger foreign-aid appropriations. Substituting public money for private enterprise money is a poor way to serve the American people.

All the shooting on this tax question began with attempts to reduce the outflow of gold. But cutting down foreign investment abroad by confiscatory taxes on private individuals and companies, and then being forced to use public money to maintain our position in international trade is no way to go about it.

The real problem, which has been lost sight of, is to improve the competitive position of our companies operating abroad. They need more help, not the handicap that the proposed taxing measure would impose.

Up-Grading Needed

DESPITE IMPROVEMENTS IN CEMENTS over the years, a better product is needed for use in the great majority of ordinary construction jobs. Present cements are satisfactory when concrete is made under rigid control, but all too often such control is not practicable. Hence, a low-cost cement, more nearly immune to the vagaries of man and nature than existing cements, would be a great boon to the construction industry.

Until such a cement can be developed, however, a step in the direction of some of its desirable properties could be taken by providing greater uniformity in present cements. A too-frequent complaint is that the quality of portland cement not only varies with different producers but also with different shipments from the same producer.

Uniformity of cement will eliminate one of the factors that affect concrete construction adversely. But quality also should be improved; for example, by raising ASTM standards for cements.

The ASTM specifications offer minimum requirements, and cement producers have little or no incentive to make a cement that will greatly exceed them. The reason: Under present conditions there is no assurance that a better cement would be used even if specified.

This situation is a consequence of the great growth in use of ready-mixed concrete. Except for unusually large projects, ready-mix producers rarely can guarantee delivery of a concrete with a specified brand of cement to a specific job. Hence, concrete purchasers are unable to favor those cement brands that do exceed ASTM minimum requirements.

The solution is to raise the quality of all cements. An initial step would be to jack up ASTM minimums, which nearly every cement producer now meets with ease. An opportunity to do this will arise next month, when the ASTM Committee C-1 on Cement meets in Atlantic City. The opportunity should not be allowed to pass; higher standards are badly needed.

PLAIN GROUT SHRINKS . . . leaves only a web of mortar and a small shim area to support the equipment baseplate. Result is a *short-life* grout that causes shutdowns . . . possible equipment damage . . . and expensive re-grouting.

EMBECO GROUT IS NON-SHRINK . . . readily and solidly fills the space to be grouted and permanently retains its original volume. Provides full, even baseplate support . . . helps assure proper equipment positioning and alignment. EMBECO means dependable, *long-life* grout.

Today's figures show that *machinery* for the average U. S. factory costs $4,680,000[1] — a sizeable, important investment geared toward smooth, efficient production. But the *grout* under this valuable equipment *costs only pennies* by comparison.

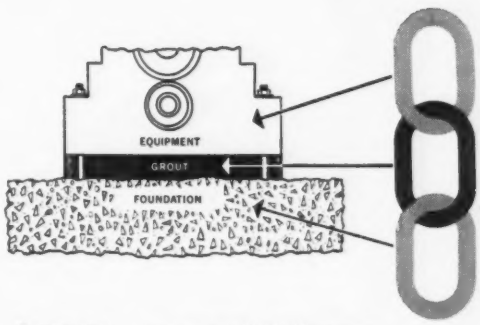
Compare the grouts pictured above. It's clear evidence that EMBECO can save *you* costly re-grouting and production downtime.

Here's why EMBECO means a superior grouting job every time—

- **Non-Shrink** . . . assures tight, level, permanent contact with equipment baseplate.
- **Flowable** . . . quickly, completely fills the space, increases ease of placeability.
- **Strong and Tough** . . . withstands impact, pounding action, vibration, side thrust and torque . . . maintains perfect alignment.

Before *you* grout another piece of heavy equipment—call in the local Master Builders field man for full information, or write to us for details on how EMBECO can help you *grout for good.*

[1]*U.S. average*—initial *machinery and equipment costs for* new *factories.*



★**GROUT** . . . is the "vital link" between equipment and foundation.

The Master Builders Company • Cleveland, Ohio
Division of American-Marietta Company
World-wide manufacturing and service facilities

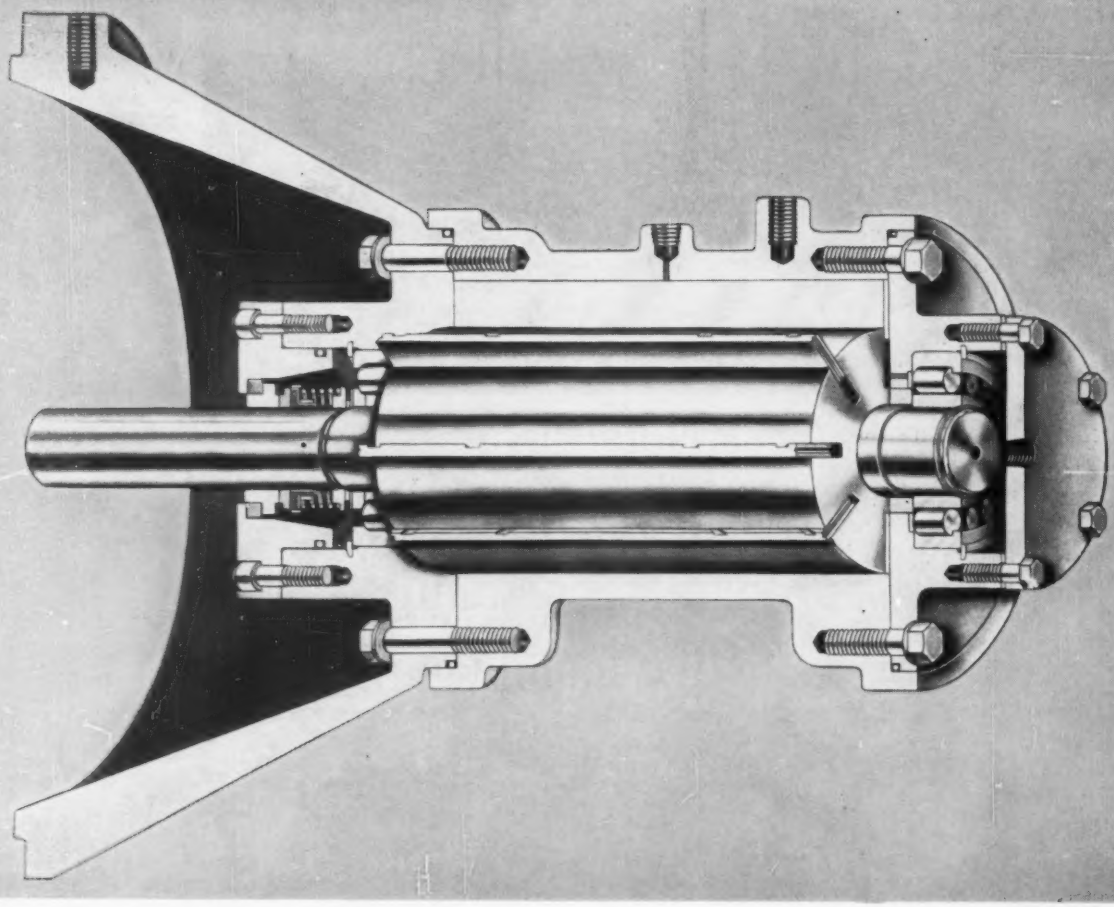
Our 50th Year

MASTER BUILDERS®
EMBECO*

*EMBECO *is a registered trademark of The Master Builders Co. for its specially-prepared, flowable, non-shrink grouting products.*

E-2006

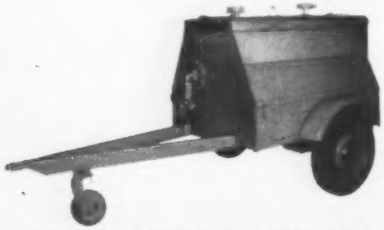
WORTHINGTON COMPRESSOR NEWS:



NEW MONO-ROTOR INTRODUCED IN 85′, 125′ AND 250′ MODELS

Now Worthington introduces the new Mono-Rotor Blue Brute compressor—a significant step ahead in improving compressor performance. The Mono-Rotor introduction follows six full years of development and field testing. It can be ordered immediately in the most commonly used sizes.

The major feature of the Mono-Rotor design is its extremely simple, dependable construction. The Mono-Rotor is built with just one stage . . . just one rotor . . . just two bearings . . . no gears . . . oil pump.



NEW 125′ MONO-ROTOR COMPRESSOR

It is simpler in construction than any two stage compressor or any screw type compressor. This simple construction is the basis of its high degree of reliability.

How reliable is the Mono-Rotor? Its reliability is so great that Worthington has quadrupled its warranty period. The standard warranty agreement has been extended from the usual 90 days to one full year. Worthington is the first compressor manufacturer supplying the construction industry to do so.

What makes the new Mono-Rotor design so successful? It is the new Worthington-developed rotor-to-cylinder sealing. For over ten years the industry has attempted to solve this problem for larger compressor sizes. Two-stage construction was the solution until Worthington developed new methods of oil distribution within the cylinder. Now an efficient, dependable air supply is available in just one stage—one rotor construction.

The new Worthington Mono-Rotor units have other benefits, too. They are 20% lighter in weight and are designed for improved towing and tracking. The third wheel is standard equipment for easier handling on the job. There is an engine-saving clutch and many other features.

The Mono-Rotor Blue Brute can now be ordered in the 85′, 125′ and 250′ sizes. See it . . . rent it . . . or buy it at your Worthington dealer listed in the Yellow Pages under "Compressors." Or write Worthington Corporation, Dept. 60-37, Holyoke, Mass. In Canada: Worthington (Canada) Ltd., Brantford, Ontario.

WORTHINGTON

PRODUCTS THAT WORK FOR YOUR PROFIT